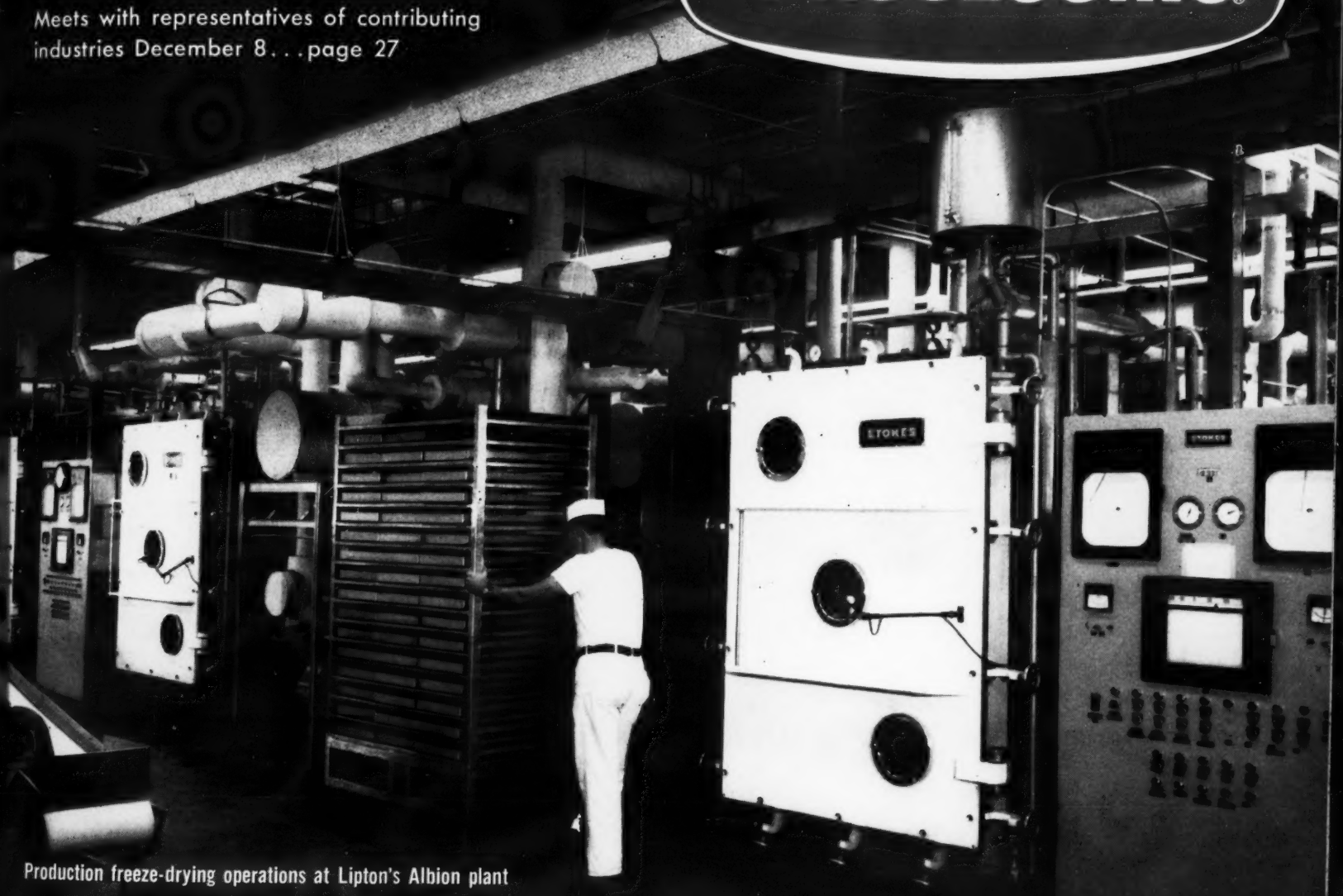
NOVEMBER 1960

THE MAGAZINE OF APPLIED TECHNOLOGY
FOR MEN WHO MANAGE

FOOD PROCESSING®

The Food Protection Committee
A force for critical evaluation of food additives. . . page 25

Meets with representatives of contributing industries December 8. . . page 27



Production freeze-drying operations at Lipton's Albion plant

FREEZE DRYING

✓ Practical approaches . . . page 28
✓ Equipment roundup . . . . page 72

$1.00 the copy
A PUTMAN PUBLICATION
"Executive Magazines for Industry"

MODERN DAIRY INGREDIENT GIVES APPETITE APPEAL TO A VARIETY OF FOOD PRODUCTS

Valley Fresh Sweet Dairy Whey, an excitingly different dairy ingredient, contributes to the taste, texture, shelf life and finished color of almost every known food product. And as others have found out...formula costs decrease.

This pure 100%, high quality, dairy ingredient goes into solution instantly and uniformly. Pound for pound, it provides a higher content of lactose (milk sugar) and lactalbumin protein than any other natural fraction of milk. Use Valley Fresh Sweet Dairy Whey to improve all your products, whether wrapped, canned, boxed or in a jar.

Valley Fresh Sweet Dairy Whey offers you this important extra: technical knowledge. At your disposal are the skill and experience of the world's largest whey products manufacturer.

Get the facts on Valley Fresh Sweet Dairy Whey today. For technical bulletins and information on other Western food ingredients, write Technical Service, Department 17K

Valley Fresh Foremost

WESTERN CONDENSING COMPANY

Appleton, Wisconsin

World-Wide Producer of Quality Milk Products

Fowl tip!

Poultry used in canning and other processing during July 1960 totaled 28,554,000 lb ready-to-cook weight — up 36 per cent from the 20,996,000 lb used in July 1959. Poultry used consisted of 22,045,000 lb of chickens, 6,491,000 lb of turkeys and 18,000 lb of other poultry.

Radishes and rockets

. . . may have much in common in the Space Age, believes Dr. S. G. Younkin, Campbell Soup Company's director of agricultural research. Noting that some of this era's most needed discoveries may come from an intensified research program on new and improved food plants, he admitted that many of these "finds" nevertheless may go unsung because of the more glamorous discoveries involving rockets and missiles.

Practicing what it preaches, Campbell Soup currently has a 55-employee staff — including 30 plant and soil specialists—investigating at least 20 different crops.

For more information on product at left, circle 6751 see information request blank opposite last page.

that's interesting

Predict tenderness at slaughterhouse

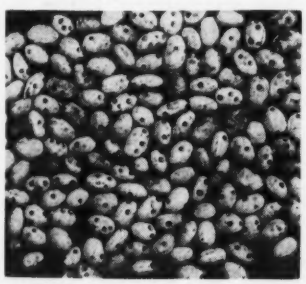
Estimating meat tenderness with accuracy right at the abattoir is possible using simple new hydraulic press. Raw or cooked meat samples are placed inside a small cylinder, and hydraulic pressure is applied by variable speed motor. When meat begins to extrude through a hole in bottom of cylinder, a pressure-gauge reading indicates degree of toughness or tenderness.

Results correlate well with taste-panel evaluations. Inventors of the device — meat technologists at the Agricultural Research Center, Beltsville, Md. — believe that it may permit meat to be sold not only as a carcass grade (U.S. Prime, Choice, etc.), but also with a tenderness index.

Hidden 'taxation'

Nearly $27 billion in destroyed food and fiber (note photo showing bean infestation) is annual "tax tribute" exacted by man's oldest and most fearsome enemy — the insect.

But, suggest the University of California's F. A. Gunther



and L. R. Jeppson in their new book — "Modern Insecticides and World Food Production" (John Wiley and Sons, New York) — insects might consider themselves entitled to this "take" because of nearly half-a-billion years "seniority" over man, the fact that they numerically comprise 70-80 per cent of all living animals, or that collectively they far outweigh all other animal life lumped together.

EGG NOG FLAVOR
RITTER HOLIDAY SPECIALS
CRANBERRY WONEX
EGG NOG FLAVOR
Combining the heady fragrance of West Indies Rum and Spices from the Orient with the rich smoothness of dairy fresh eggs.
Recommended usage: 6 oz. to 10 gallons mix.
Also available for Tom & Jerry mixes.
CRANBERRY WONEX
Concentrated by a special scientific process retaining the natural tart-sweetness of the colorful fresh cranberry.
Ideal for sherbet and ice cream.
Recommended usage: 4 oz. to 10 gallons mix.
Ask your Ritter Technician or send for a generous sample.
F. RITTER & CO.
RITTER INTERNATIONAL
4001 Goodwin Avenue
Los Angeles 39, California
Branches Throughout the World

6752 on Reader Service Slip.

HOW MANY CANS DO YOU OPEN A DAY?

Do the job FASTER, CHEAPER with the new...

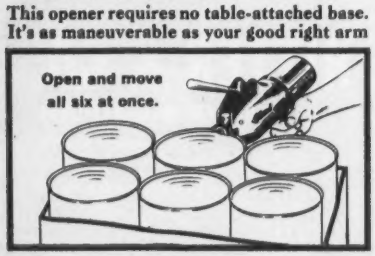
Edlund PORTABLE ELECTRIC CAN OPENER

DO A BETTER JOB FASTER

The new Edlund Portable will open 500-750 cans per hour for you, depending upon your production set-up, leaving smooth edges on every can.

THE ONLY *REALLY* PORTABLE ELECTRIC OPENER

This opener requires no table-attached base. It's as maneuverable as your good right arm and operates with complete efficiency in any production set-up... single can, assembly line, or cans in the case.



STOP MOVING HEAVY CANS!

Just move the Edlund Electric from can to can. It weighs less than a #10 can and is perfectly balanced for easy handling. The pistol grip with trigger on/off switch gives you absolute cutting control.

PAYS FOR ITSELF IN SHORT ORDER

In large or small volume, the Edlund Portable's speed and durability will save you enough time and money to pay its cost many times over. It is simple to clean because you can really "get at" all cutting parts. It works as well on a sardine can as on a #10 can and, in actual kitchen tests, has opened hundreds of thousands of cans and still performs perfectly.

CHECK THESE VERY VITAL STATISTICS

The new Edlund Portable Electric Can Opener has an AC-DC Universal Heavy Duty Motor, is UL approved with 3-prong ground wire safety plug. The motor housing, opener assembly and handle are die-cast aluminum for maximum strength with minimum weight. Both cutting wheel and gear are of hardened tool steel to assure smooth cutting and long wear. Magnet (optional) eliminates "fishing" for lids. Equipped with hang-up bracket, this opener stores out of the way. Provision is also made for permanent installation, if desired.

Available from Edlund Dealers everywhere.

Edlund
Burlington, Vermont

6753 on Reader Service Slip.

Arthur Godfrey and freeze drying

One of Arthur Godfrey's pet gags concerned Lipton's dry soup mixes. While extolling the virtues of these mixes, Godfrey said he could never find any chicken in the chicken soup. Basis for this gag no longer holds true.

Introductory, four-color ad below, which will run this month in Life, Look and

newspaper supplements launches firm's campaign to introduce two new soup mixes which contain freeze-dried chicken and sliced mushrooms.

Lipton is just one of many food processors in freeze drying. Liana Co. will soon package freeze-dried shrimp for supermarkets; has 20 other sea food items ready. Other food processors are test marketing their products.

Present status of freeze drying is featured in an article starting on page 28, and a roundup of test facilities and equipment now available is presented starting on page 72.

Frank E. Bowen
ASSOCIATE EDITOR

over the editor's shoulder

THE MAGAZINE OF APPLIED TECHNOLOGY
FOR MEN WHO MANAGE

NOVEMBER 1960
VOL. 21 NO. 11

FOOD PROCESSING

CIRCULATION OVER 39,000

Highlights

25 A critical evaluation of food additives
National Research Council's Food Protection Committee quietly probes the basic problems — FP Staff

28 Industry interest mounts in freeze drying
Production equipment and pilot-plant equipment becomes more widely available; test facilities on commercial and lab scale offered to food industry — Howard P. Milleville, Editor

33 Centralized automatic flow control for batch mixing of liquid ingredients
Part IV, Automation at Hood Dairy — Howard P. Milleville, Editor

37 How a major packager meets the Additives Amendment
Robert N. Johnson, Chief Chemist, Processed Foods Division, The Kroger Co.

73 Freeze drying equipment roundup
What test facilities are available to processors? Who are the suppliers of equipment? — Frank L. Bonem, Associate Editor

Also Featured

21 Research and development for continuous dough mixing on full production scale

23 Ultrasonics to measure meatiness of live animals approaches practicability

43 Electronic computor for least-cost, highest-quality sausage formula

45 Processing innovation opens way to new uses for cranberries

51 Crystalline cellulose offers many advantages as food ingredient

60 How to keep pipe ells insulated

82 Uniformly feeds green beans to battery of 12 snippers

95 Pneumatic conveying makes bulk storage in the sky practical

101 Versatile, 20-ft 'boxes' ease freight delivery via road, rail or sea

115 Automatic bottle inspectors spot tiny particles at top speeds

122 Brings 'non-shock' benefits to medium-speed casing

EDITORIAL SECTIONS

Ingredients 45
Sanitation & Maintenance ... 60
Processing, Instrumentation and Control 73
Material Handling and Transportation 95
Packaging 115

DEPARTMENTS

Products & Packages 8
Conventions & Exhibits 10
Food Regulations 11
Association News 18
Plants, Companies and Personalities 19
Laboratory Developments 92
Classified Technical Literature ... 125

SPECIAL READER SERVICE

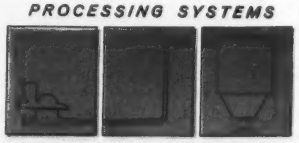
• Advertising Index 131
• When you want more information, see Reader Service Slip .....Opp. 132
• If you want to subscribe to this magazine, see reader qualification form .....Opp. 133

If your present product recovery system is not delivering maximum efficiency, you may be paying an exorbitant price for dust that is merely blowing away. Add to this the possible damaging effect on equipment, on employee morale, on general plant appearance and community relations. The most practical and *economical* solution of any dust problem is the MIKRO-PULSAIRE Collector, now available in new flexible modular units designed to meet any required capacity however large or small . . . attested recovery efficiency 99.9% plus . . . absolutely no moving parts, internally or in the gas stream . . . 4 or 5 times the capacity of conventional bag houses per unit of bag area. For the toughest dust collection jobs, call on our engineering staff, and the MIKRO-PULSAIRE.
Ask for Bulletin 52A-1.

MIKRO-Products
PULVERIZING MACHINERY COMPANY
63 Chatham Rd., Summit, N. J..
A Division of American-Marietta Company

SPAN THE GLOBE

PROCESSING SYSTEMS



REPRESENTATIVES throughout the United States, Continental Europe, British Isles, Canada, Mexico, Central and South America, West Indies, South Africa, India, Japan, Philippines, Australia and New Zealand.
MANUFACTURING FACILITIES: United States, Canada, Continental Europe, British Isles.

6754 on Reader Service Slip.

FOOD PROCESSING

(Food Processing Preview)

©Putman Publishing Company 1960

EDITORIAL STAFF

Editor
Howard P. Milleville
Associate Editor, Palo Alto, Calif.
Karl Robe
Associate Editor
Norbert J. Leinen
Associate Editor
Joseph J. Voorhees
Associate Editor
Frank L. Bonem
Assistant Editor
Marion P. Lankford
Washington Editor
Joan Marziotti
Art Director
Ralph C. Donges
Editorial Assistant
Romayne L. Chamberlain
Editorial Production
Myrna Jorgensen
Patricia Beswick

Over 39,000 Circulation in the Food Processing Industries

Bakery Products
Beverages, Alcoholic and Non-alcoholic
Canned, Preserved and Dehydrated Foods
Confectionery and Chocolate Products
Dairy Products — Milk, Ice Cream, Butter
Frozen Foods
Grain Products — Flour, Cereals, Meals, Starches, etc.
Meat and Meat Products
Sugar and Syrups
Allied Lines — Flavors, Pickles, Vinegar, Gelatin, Oils and Fats, etc.
Consultants
Food Equipment Manufacturers

BPA Business Publication Audit of Circulation, Inc.

FOR MEN WHO MANAGE
Published in Chicago
Food Capital of the World

November 1960 Vol. 21 No. 11

Published monthly by
PUTMAN PUBLISHING COMPANY
111 E. Delaware Place
Chicago 11, Ill.
Telephone: WHitehall 4-6141

Creators of ***Putman-Style***
Magazines

FOOD PROCESSING • FOOD BUSINESS
CHEMICAL PROCESSING
WHAT'S NEW in CHEMICALS
QUEST . . . for tomorrow
WHAT'S NEW in plant-engineering
EQUIPMENT

ADMINISTRATION

RUSSELL L. PUTMAN
President and Publisher

CHARLES H. OESTMANN
Publishing Director

EWING W. GRAHAM
Vice President and Treasurer

GEORGE W. N. RIDDLE
Vice President—Research

THOMAS J. SCANLON
Director of Circulation

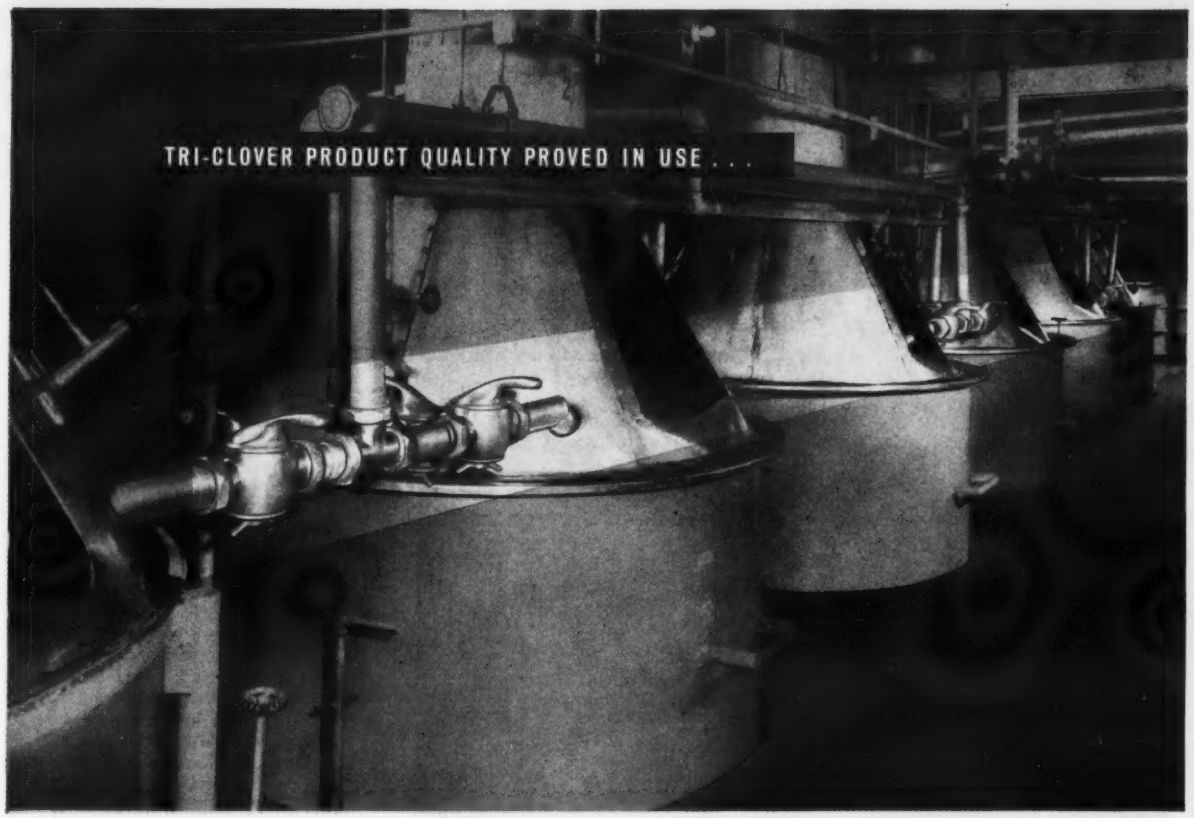
ROBERT C. MC KAY
Circulation Manager

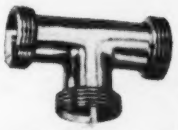
JAMES C. BUDD
Production

Advertising Representatives and offices on page 131

SUBSCRIPTIONS

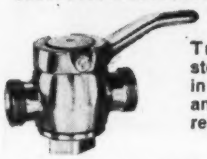
Qualified-Reader Subscriptions are accepted from selected management and technical Key-men in the food industries without charge. To apply for a qualified-reader subscription, fill in and mail the request-qualification form opposite last page. Other subscriptions — from "non-qualified" persons (those who are not key processing men in the food industries) — are accepted at $1.00 the copy, or $10.00 the year. Foreign subscriptions — subscriptions from countries outside the territory of the United States and its possessions, are acceptable at $35.00 per year. Such subscriptions are not counted as "industry circulation" on BPA audit reports. Accepted as controlled circulation publication at Mendota, Ill. Publication office: 111 East Delaware Place, Chicago 11, Illinois. *Printed in the United States*





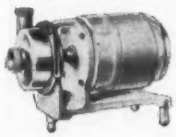
Tri-Clover stainless steel "standard" sanitary threaded fittings with bevel seat construction.

Tri-Clover Tri-Clamp fittings offer quick easy assembly and disassembly; long trouble-free fitting life.



Tri-Clover stainless steel valves are made in a full range of types and sizes to meet every requirement.

Tri-Clover full-flow magnetic traps employ an Alnico magnet to assure maximum removal of tramp metal.



Tri-Clover centrifugal pumps are fabricated of highest quality corrosion-resistant metals for efficient long-term service.

Series of Tri-Clover Valves serve HUNT FOODS Plant for almost 20 years

The "battery" of Tri-Clover stainless steel valves shown above are being used in the Hunt Foods, Inc. plant at Fullerton, California, in an atmospheric evaporator process for producing the well-known Hunt's tomato sauce. An "ordinary" installation, perhaps, except that *these same Tri-Clover valves have been giving reliable, trouble-free service in this plant for almost twenty years!*

Here is an outstanding example of the high quality material and workmanship that's "built-in" to the complete line of Tri-Clover stainless steel fittings, valves, pumps and tubing.

Why not let Tri-Clover quality products help to achieve new standards of efficiency and sanitation in *your* processing operations? Let our engineering staff help in solving your specific corrosion-resistant liquid or semi-solid conveying line problems.

See your nearest Tri-Clover Distributor.

TRI-CLOVER S-659

LADISH CO.
Tri-Clover Division
Kenosha Wisconsin

IN CANADA: Brantford, Ontario
EXPORT DEPARTMENT: 8 South Michigan Avenue, Chicago 3, Illinois Cable TRICLO, CHICAGO

6755 on Reader Service Slip.

Take the legwork out of liquid measurement

Here's practical liquid measuring—the modern way... without roaming all over the lot! Liquidometer Gauges let you inventory distantly stored liquids at a glance.

Completely automatic Liquidometer Gauges can be located as far as 250 feet from tanks. Think what this centralized system can mean in man-hours saved—let alone the additional safety of personnel who no longer have to trudge to, or tamper with, hard-to-get-at tanks.

Simple to install, and requiring no maintenance, Liquidometer Gauges measure virtually all liquids conveniently, continuously, and correctly. There's a type available for practically every liquid measuring application.

For complete details, write

LIQUIDOMETER INSTRUMENTS

THE LIQUIDOMETER CORP.

Dept. G, LONG ISLAND CITY 1, NEW YORK

6756 on Reader Service Slip.

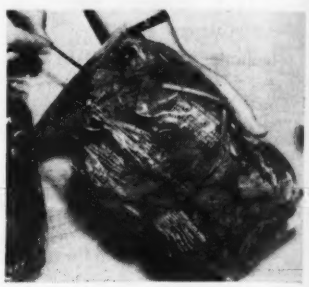
PRODUCTS AND PACKAGES

Multisalad pack . . .

. . . now being marketed by Mrs. Kinser's Home Style Foods, Inc., Atlanta, Ga., gives supermarket shoppers a view of three assorted salads, yet locks the eight-oz tapered cups securely against customer tampering (by means of inner flaps).

Supplier: "Can Band" multiple package by Container Corporation of America, 38 S. Dearborn St., Chicago 3, Ill.

6757 on Reader Service Slip.



More zip for zpinach . . .

. . . is Safeway Stores' answer to customer demands for an easy-opening device on produce packages. Red Zip-Tape runs down front of the four-color, flexo-printed, ventilated, heat-sealed cello bags — provides easy-open feature for pre-packaged "Waldorf" brand fresh spinach.

Supplier: The Dobeckmun Co., A Division of The Dow Chemical Co., P.O. Box 6417, Cleveland 1, Ohio.

6758 on Reader Service Slip.

Upstanding example . . .

. . . of an automatic-bottom cellophane bag that will stand erect on store shelves is a new and exclusive development ideal for cookies, candy, rice, etc. Bag comes in sizes from four-oz through five-lb.

Supplier: Continental Can Co., Flexible Packaging Div., 100 E. 42nd St., New York 17, N. Y.

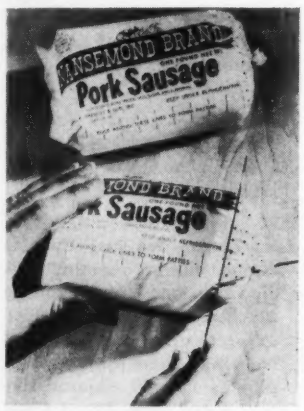
6759 on Reader Service Slip.

Glass-consciousness . . .

. . . on part of many consumers has led Venice Maid Co., Vineland, N.J., to begin packing spaghetti sauce in glass jars — supplied by Armstrong Cork Co., Lancaster, Pa. The world's largest packer of private-label institutional foods, and a large producer of soups and Italian specialties under its own label, Venice Maid has used cans exclusively since its founding 27 yr ago, now feels that glass jars will open up new consumer purchasing avenues, on the principle that "a person who likes to buy in glass will not buy in tin."

Baked 'Shrab-meat' . . .

. . . is simple to prepare from frozen product packed in a seven-oz Marathon foil heat-in tray with lid. Consisting of shrimp stuffed with deviled crab, and covered with dairy butter, the entirely new frozen prepared sea food item is packaged and marketed by Neptumalia Seafood Co., Inc., Thunderbolt, Ga.



Tubes for foods . . .

. . . designed for packaging one-lb units of bulk sausage, also can be used for similar units of lard, mush, seasoned ground meat, scrapple, chopped liver and other meat-counter items. Composed of two-mil white poly, the bags may be imprinted with a special design — thus offering "two-color" printing (red on the white background) for price of one-color work. Tube-constructed without a backseam, the bags measure three by two by eight in., have a heat-sealed bottom and are closed by heat sealing or twist-ties.

Supplier: The Dobeckmun Co., a Division of The Dow Chemical Co., P.O. Box 6417, Cleveland 1, Ohio.

6761 on Reader Service Slip.

Strong combination . . .

. . . of flexible materials meets the stringent flavor-moisture vapor lock packaging requirements for Bleu Cheese salad-dressing mix introduced by Lawry's Foods, Inc. From outer layer inward, pouch is formed of acetate, foil, paper and another layer of foil. The paper and inner foil layer are joined by a polyethylene extrusion — adding, in effect, an extra protective stratum. To assure good sealing, a vinyl heat-seal coating is applied to the inner foil.

Supplier: Milprint, Inc., 4200 N. Holton St., Milwaukee 1, Wis.

6760 on Reader Service Slip.

Barrier bags . . .

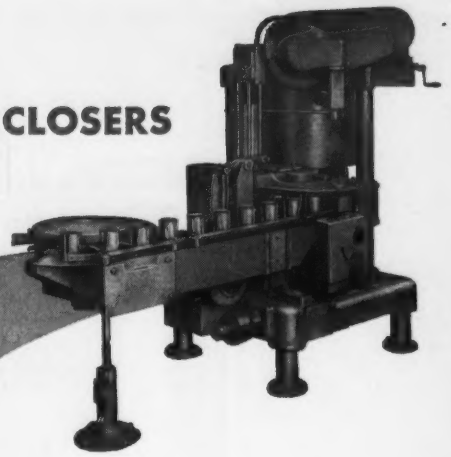
. . . that combine necessary strength with excellent water vapor barrier characteristics provide institutional size bags of excellent utility for Kraft Foods' nonfat dry milk crystals and instant chopped onions — also are suitable for such hygroscopic foods as instant potatoes, powdered cocoa, ice cream mix, spices, gelatin desserts and pie filling.

"Moistite" bags may be reclosed repeatedly to keep unused contents dry; when empty, they may be crumpled and discarded.

Supplier: Crown Zellerbach Corp., Western-Waxide Div., 2101 Williams St., San Leandro, Calif.

6762 on Reader Service Slip.

ANGELUS CAN CLOSERS



Minute Maid ®

TEXACO ®

KNOWN FOR THE COMPANY THEY KEEP...

KNOWN FOR THE SERVICE THEY PROVIDE

NESTLE ®

AJAX ® CLEANSER

HERSHEY'S ®

Hunt ®

General Mills ®

No better recommendation exists than the list of "blue chip" customers who use one or more models of Angelus Closing Machines for efficient and cost-cutting service.

The performance of Angelus Closing Machines is based not only on top-grade materials and quality of workmanship but on the right design to meet specific production problems. These leading canners know that Angelus, the only company in the world producing can closing machines exclusively, devotes all of its design efforts to create equipment for greatest production efficiency and easiest possible maintenance.

Let Angelus put its 50 years of experience to work in solving your can closing production problems. Write today for complete details. Specify products, can dimensions and your capacity requirements.

ANGELUS

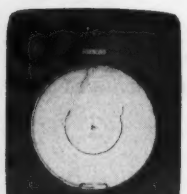
Sanitary Can Machine Company

Cable Address "Angelmaco" Western Union Code
4900 Pacific Boulevard • Los Angeles 58, Calif.

6763 on Reader Service Slip.

Foxboro eliminates the amplifier from pH recording and control

cuts the drift, cuts the cost, cuts the maintenance, too!



Foxboro pH Dynalog Controller — for use where it is desired to hold pH at a predetermined value.

Foxboro pH Dynalog Indicator — for use where complete record of pH value is not required.

THAT'S RIGHT — the intermediate amplifier is gone from Foxboro's new low-cost system for measuring pH. And gone with it is the wasted panel space, the drift, the daily standardization inherent with earlier systems.

In the new Foxboro system, the signal from the pH electrode goes direct to a high impedance Dynalog* receiver — without intermediate amplification. Signal operates a direct-reading indicator or recorder—or a controller and alarms, when desired.

The new Foxboro pH system is the simplest, most economical method of measuring pH available today. Ask your Foxboro Field Engineer to tell you about it. Or write for data sheet. The Foxboro Company, 9211 Neponset Avenue, Foxboro, Massachusetts.

*Reg. U.S. Pat. Off.

FOXBORO Analytical Instrumentation

REG. U.S. PAT. OFF.

6764 on Reader Service Slip.

conventions and exhibits

Nov. 14-17. American Bottlers of Carbonated Beverages, 42nd convention and concurrent 1960 International Soft Drink Exposition, Cobo Hall, Detroit.

Nov. 28-29. Food and Drug Administration and The Food Law Institute, annual meeting, Health, Education and Welfare Auditorium, Washington, D.C.

Dec. 3-9. Chemical Specialties Manufacturers Assn., 47th annual meeting, Hollywood Beach Hotel, Hollywood, Florida.

Dec. 8. Food Protection Committee Symposium for members of Liaison Panel, ballroom, Statler-Hilton Hotel, Washington, D.C.

Dec. 26-31. American Assn. for the Advancement of Science, annual meeting, Philadelphia.

Jan. 8-10. National Preservers Assn., annual convention, Galt Ocean Mile Hotel, Ft. Lauderdale, Fla.

Jan. 22-25. National Canners Assn., annual meeting (including concurrent Canning Machinery & Supplies Assn. exhibit of canning and freezing machinery, supplies, services), Conrad Hilton Hotel, Chicago.

Jan. 23-26. Twelfth annual Plant Maintenance & Engineering Show and concurrent (Jan. 23-25) Conference, International Amphitheatre, Chicago.

Feb. 1-4. American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., and 2nd Southwest Heating and Air-Conditioning Exposition, Baker Hotel and Memorial Auditorium, Dallas.

Feb. 6-8. National Dairy Council, 46th annual meeting, Brown Hotel, Louisville.

food regulations

FDA lists color additives

Cleared for temporary use under Color Additives Law

First regulations under the Color Additives Amendment to the Food, Drug, and Cosmetic Act have been issued by FDA.

The regulations, effective immediately, contain the following provisions:

1. They list the previously permitted coal tar colors, which may continue to be used in foods, drugs and cosmetics without any restrictions on the amounts used until the necessary retesting is accomplished.

2. They terminate the listing for *any* use in foods, drugs or cosmetics of the colors External D & C Yellows Nos. 9 and 10.

3. The new regulations terminate the listing for *unrestricted* use of 13 coal tar colors, largely lipstick colors, previously used without any limitation on the amount used.

4. Temporary tolerances are established for colors used in lipsticks, mouth washes, dentifrices and/or drugs for 11 of the 13 colors delisted for unrestricted use.

No tolerances were provided for two other colors, D & C Yellows Nos. 7 and 8, because none had been requested, FDA said.

5. The new regulations also list color additives other than coal tar colors which were known to have been used in foods, drugs and/or cosmetics prior to enactment of the law on July 12, 1960, and which may therefore continue in use for a 2½ year grace period, or unless and until data are available on which to establish a tolerance or to revoke the provisional listing.

FDA said that there may be other non-coal tar colors not listed which were in use prior to July 12. The agency urged manufacturers of such colors to bring them to its attention promptly so that they may be added to the provisional list if it appears that they may be safely used.

In issuing the new regulations, FDA Commissioner George P. Larrick called attention to the extensive pharmacological testing which must be done by the manufacturers or users of color additives in order to support listing and permanent tolerances for these additives.

Mr. Larrick said that FDA could not possibly perform all the testing required on colors during the 2½ year transitional period, and called a meeting of industry representatives and all other interested persons to discuss the matter of responsibility for these tests.

The new Color Additive regulations appear in the *Federal Register* of October 12, 1960. Those colors appearing in the *Federal Register*, which have application to foods, are listed below:

FD&C Green No. 1
FD&C Green No. 2
FD&C Green No. 3
FD&C Yellow No. 5
FD&C Yellow No. 6
FD&C Red No. 1
FD&C Red No. 2
FD&C Red No. 3
FD&C Red No. 4
FD&C Blue No. 1
FD&C Blue No. 2
FD&C Violet No. 1
Lakes (FDC)
Citrus Red No. 2 (for use on mature oranges)
Annatto
Beet Juice
Bixin and norbixin
Caramel
Carbon black (prepared by the "impingement" or "channel" process)
Carminic acid
Carotene, natural and synthetic
Charcoal (NF XI)
Chlorophyll copper complex and chlorophyllin copper complex
Cochineal
Iron oxides
Titanium dioxide (limit of 0.4 per cent as pigment in bakery and confectionery products)
Turmeric and curcumin
Ultramarine blue, 0.5 per cent in salt for animal feed

screens

GREATEST CAPACITY, per-square-foot of screen cloth area • EFFICIENT FOR ALL MATERIALS, wet or dry, fine or coarse, hot or cold • EASY TO INSTALL, light-weight, no transmitted vibration • ECONOMICAL OPERATION, low maintenance • FLEXIBLE, 18", 30" & 48" dia. units, single or multiple separations • CLEAN SEPARATION, ACCURATE SIZING, in range from coarse to 325-mesh • LONG SCREEN CLOTH LIFE, less blinding • SELF-CONTAINED, ready to operate.

foods

SWECO Vibro-Energy Separators do many vital jobs for the food industry, faster and better. For example: Removing solids from waste solutions. Clarifying oils, syrups, glazes. Straining jams, jellies, pastes, purees. Straining liquids. Removing oversizes, impurities. Sifting meals, powders, crystals. Grading dry materials. Sorting fines and oversizes.

For technical data or free screening demonstration in *your* plant, with *your* materials, write: Dept. 1-4

SOUTHWESTERN ENGINEERING COMPANY

4800 Santa Fe Avenue, Los Angeles 58
Engineers • Constructors • Manufacturers

6765 on Reader Service Slip.

For fresh-from-the-field **FLAVOR!**

GIVAUDAN IMITATION STRAWBERRY

Nothing compares with the flavor of fresh wild strawberries. And nothing has duplicated that flavor as closely as Givaudan's Imitation Strawberry!

It is economical—highly concentrated yet easy to use on a controlled level. And it's stable—ideal for use in milk-containing products as well as in confections, summer drink powders and other preparations. Available in liquid or crystal form. May we send you samples and more complete information?

Givaudan Flavors Inc.

321 West 44th Street
New York 36, N. Y.

6766 on Reader Service Slip.

food regulations

Must educate public on safety of food chemicals

Retiring president of the National Agricultural Chemicals Association, Jackson Vernon, has told his NAC colleagues that the consuming public must be reassured of the essentiality and safety of agricultural chemicals before growing concern stifles the research necessary to the nation's agricultural progress.

"The factual evidence is overwhelmingly on our side," Mr. Vernon said. "We should welcome the opportunity to tell our story. When and where we have had the chance and done so, we have never regretted it."

Specifically, Mr. Vernon, vice president of Food Machinery and Chemical Corp., proposed that industry support an informal federation of chemical trade associations to cooperate in such fields of common interest as food additive legislation.

The increasing use of scientific advisory committees indicates a need for a sound program of committee procedures to assure adequate and proper handling of the variety of problems being referred to such specially created groups.

Rep. Jamie L. Whitten (D., Miss.) echoed Mr. Vernon when he told the NAC membership that the entire nation's food supply is being threatened through lack of knowledge on the part of the public as to just how dependent we all are on chemicals for an adequate food supply.

These speeches were made at the 27th annual meeting of NAC at Coronado, California, September 27.

New regulations under Additives Amendment

Hydroxypropyl methylcellulose: May be safely used in food, except confectionery and standardized foods which do not provide for such use, under the following conditions:

(a) The additive is a cellulose ether containing both propylene glycol and methyl

groups attached by ether linkages and contains, on an anhydrous basis, not more than 1.82 degrees of substitution as methoxyl, and not more than 0.30 degree of substitution as propylene glycol ether groups.

(b) The additive meets all the specifications described in The National Formulary, Eleventh Edition.

(c) It is used for intended use as an emulsifier, film former, protective colloid, stabilizer, suspending agent or thickener, in accordance with good manufacturing practice.

(d) The container shall be adequately labeled.

Propylene glycol alginate: May be used as a stabilizer in ice cream, frozen custard, ice milk, fruit sherbet and water ices — not to exceed 0.5 per cent of the weight of the finished product as an emulsifier, stabilizer or thickener in foods, except for standardized foods that do not provide for such use.

Use of this additive will conform to the provisions of the standards of identity, for frozen desserts, which were issued recently.

NEW ADDITIVE PETITIONS

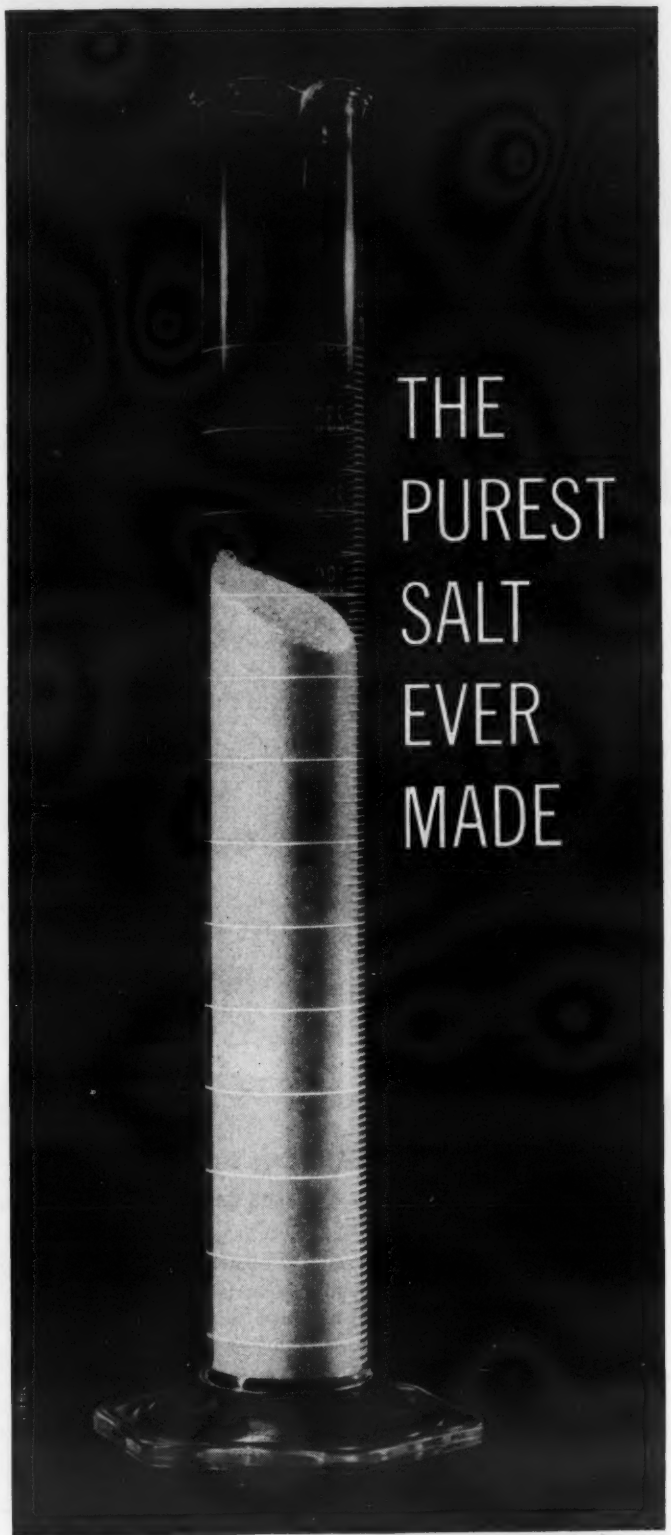
Trichloroethylene: 25 ppm for residues in decaffeinated ground coffee and 10 ppm in instant decaffeinated coffee. (General Foods Corp.)

Di-starch phosphate: As a thickening agent in, and to promote smoothness of, texture and palatability of foods. (Corn Products Co.)

Cationic starch: For sizing paper and paperboard employed in containers which will come in direct contact with food. (National Starch and Chemical Corp.)

Solvents used in the extraction of spice oleoresins: To establish tolerances for residues in spice oleoresins as follows — acetone, 30 ppm; ethylene dichloride, 25 ppm; hexane, 25 ppm; isopropyl alcohol, 50 ppm; methanol, 50 ppm; methylene chloride, 30 ppm; trichloroethylene, 30 ppm.

continued on page 16

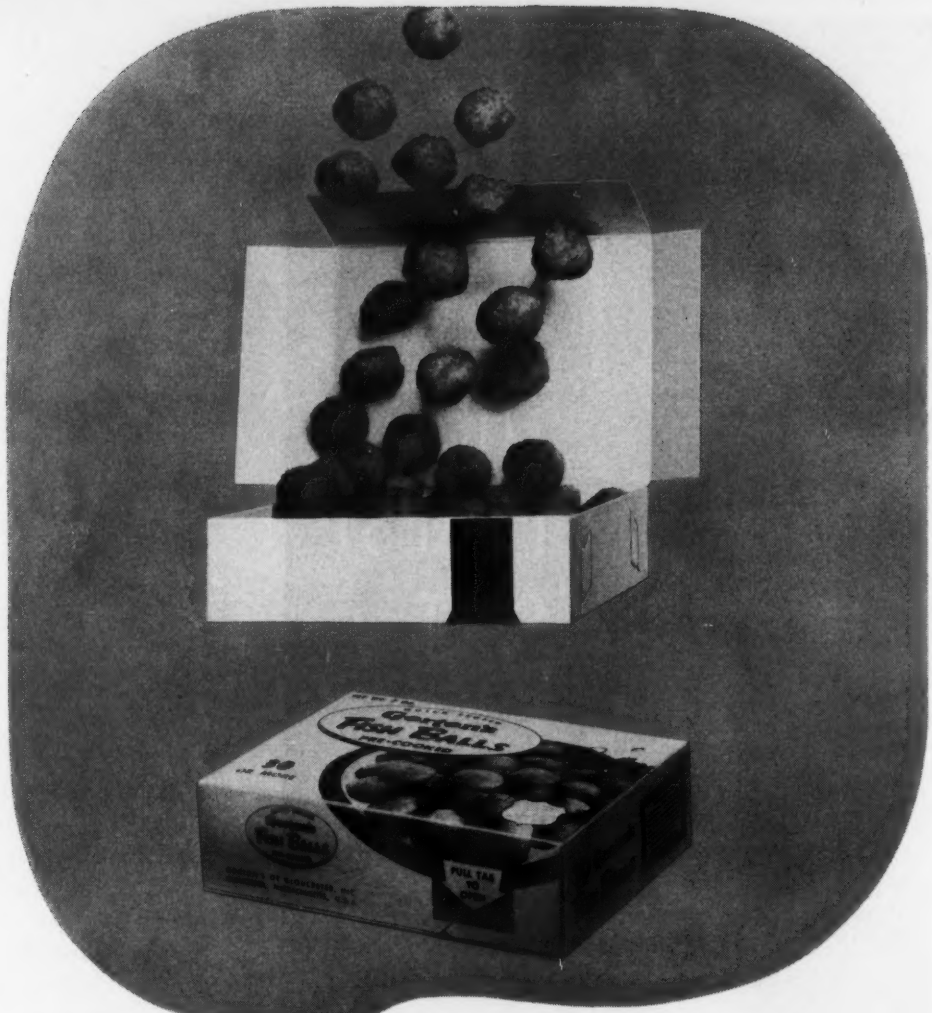


■ By actual analysis, Sterling Purified Salt is more than 99.9% sodium chloride. It contains less than 30 ppm calcium and magnesium, less than 0.2 ppm trace metals. This exceptional purity, as well as uniform granulation, makes Sterling Purified Salt ideal for butter, oleomargarine, cheese, salad dressings, potato chips, baked goods, canning, meat packing . . . hundreds of other processes where flavor, color and texture must be protected. Free-flowing Sterling Purified Salt can be used in dry form. Or it can be made into clear, fully saturated brine in the new Brinomat dissolver. The all-plastic Brinomat, available in many sizes, has the highest flow rating of any similar dissolver. Contact International Salt Co.,headquarters: Clarks Summit, Pa. District offices: Boston, Buffalo, Charlotte, Chicago, Cincinnati, Detroit, Newark, New Orleans, New York, Philadelphia, Pittsburgh, St. Louis.

INTERNATIONAL STERLING SALT SALT COMPANY

"A STEP AHEAD IN SALT TECHNOLOGY"

6767 on Reader Service Slip.



CCA

Gorton's High-Efficiency Secret:

Seal Top-Loaded Printed Cartons with High-Frequency Waves

Gorton's of Gloucester, on a single line, packs seven different seafoods in wrapperless cartons—thanks to CCA's versatile top-loading Di-Electric Sealer*. Di-Electric seals securely when high-frequency waves activate cold glue—no de-waxing. Top-loading provides product flexibility. Di-Electric gives package flexibility—seals hand- or machine-loaded cartons, adjusts to varying sizes. CCA printed cartons combine product protection with sales appeal—no overwrap needed. To pack it—move it—sell it is the business of CCA packaging.

*Patented

CONTAINER CORPORATION OF AMERICA

World's largest producer of paperboard packaging Chicago 3...Local service from 122 strategically located manufacturing centers

Folding Cartons, Shipping Containers, Sefton Fibre Cans, Molded Plastic Products, Point-of-Purchase Displays, Paperboard

6768 on Reader Service Slip.

For more information on product at right, circle 6769

FLO-SWEET AMBERDEX . . . the sweetener with "character"

Its sparkling clear, amber color tells you, "Here's a quality liquid sweetener with real character!"

Flo-Sweet Amberdex is constantly finding new uses in a variety of foods where something a little out of the ordinary is desired. High in sweetening power, rich in flavor, tops in quality—Amberdex is opening up new sales opportunities for alert producers in the food industries.

If you're working on exciting new products of your own—if you're looking for a full-flavored sweetener that's different, but not too different . . . try Amberdex. Your Flo-Sweet Engineer will be glad to give you full details or write for the brochure "New Ingredients for New and Improved Food Products." It tells all about four new Flo-Sweet liquid sugars!

YOU'LL WANT TO TRY AMBERDEX FOR . . .

Cakes
Cookies
Pies
Breads
Multiple Foods
Wines

REFINED SYRUPS & SUGARS, INC.
YONKERS, NEW YORK

SERVING INDUSTRIAL SUGAR USERS EXCLUSIVELY
FROM YONKERS, ALLENTOWN, DETROIT, TOLEDO

FLO-SWEET®
FIRST IN LIQUID SUGAR

(Kalamazoo Spice Extraction Co.)

Starch modified with phosphorus oxychloride: To provide for safe use as a thickener in foods. (American Maize Products Co.)

Cellulose acetate propionate resin: To provide for safe use in food production and packaging. (Eastman Chemical Products, Inc.)

Sodium ferrocyanide: 5 ppm as an anticaking and free-flowing agent in sodium chloride for human and animal consumption. (International Salt Co., Inc.)

USDA proposes: smoked meat should not weigh more than uncured

USDA has invited meat producers and distributors, as well as consumers, to express their views on a Federal inspection requirement for smoked meat. The requirement under review is that the weight of smoked meat products shall not exceed the weight of the fresh, uncured article.

A special department committee has been set up to consider possible revision of the smoked meat provision from the standpoint of consumer protection as well as current production and marketing practices.

The provision covers such smoked meats as hams, pork shoulders, pork shoulder picnics, pork shoulder butts and beef tongues. The practice of preparing meats with curing solutions before smoking increases their weight. Proper smoking and drying removes water and brings these products back to uncured weight.

USDA officials say review of the smoked meat provision is needed because of possible changes in consumer preference as well as in meat processing and marketing. According to USDA, consumer tastes appear to be moving toward the milder, less salty, smoked meat products. Also in recent years there have been modifications in meat smoking facilities and methods.

Comments and supporting information can be submitted until November 20 to the Director of the Meat Inspection Division, ARS, USDA, Wash. 25, D. C.

Urges amending standards for cottage cheese

Directors of the American Cottage Cheese Institute, meeting in Ithaca, N.Y., reviewed a recent Institute poll, which showed evidence of a need for amending the Federal standards for cottage cheese.

Two specific changes favored by Institute members are to permit the use of stabilizers and mold inhibitors in cottage cheese. Overwhelming industry support for these two proposals has encouraged the Institute to draft a suitable recommendation for amending the Federal standards.

Neil Angevine, President of the Institute, commented, "All interested parties, both individuals and trade associations, are invited to join with the American Cottage Cheese Institute in promoting these proposed changes."

The urgency for the new amendments is pointed up by a recent Food and Drug Administration citation against a cottage cheese manufacturer using stabilizers.

Comprehensive study on fats in animal feeds

A comprehensive study on "Utilization of Fats in Poultry and other Livestock Feeds" has been published by USDA.

With the increased use of animal feeds supplemented with fats (over half a billion pounds of animal fats are used annually in feeds today), FDA has taken regulatory action against abuses in this area.

Because of the FDA action, the publication should be especially helpful to poultry and livestock growers, as well as feed and fat manufacturers.

The study reviews information gathered prior to and since 1954, when animal feeds supplemented with fats were first produced commercially on a large scale. Included are tentative definitions recommended by the Association of American Feed Control Officials to avoid uncertainty and confusion in naming, grading and classifying fats for use in feeds. Also included are standards for analytical characteristics and physical properties approved by the Nutrition Council of the American Feed Manufacturers Association.

The study deals with antioxidants used for these fats, procedures to be followed in adding them and their effect on nutrients in the fats; methods of storing the fats; methods of mixing them with feeds; and problems involved in pelleting fat-containing feeds.

Research on the feeding of fat-supplemented rations to animals is also reviewed.

Single copies of "Utilization of Fats in Poultry and Other Livestock Feeds" (Utilization Research Report No. 2) can be obtained by writing to the Office of Information, USDA, Wash. 25, D. C.

Time extensions for 50 additives

FDA stayed effective date of Additives Law to March 6, 1961 for 50 additives designed for special food applications.

Included are 16 direct additives and 34 indirect additives. Complete list appears in the *Federal Register* of October 6, 1960.

USDA to help promote 1960 cranberry crop

Secretary of Agriculture Ezra Taft Benson has pledged USDA help in merchandising the 1960 cranberry crop.

The Department has launched a "Special Plentiful Foods Program" for cranberries and will assist the industry by making food trade contacts and issuing information to the press.

In praising the self-help

program developed by cranberry growers and cooperatives, The Secretary pointed out that the industry last November was faced with a marketing problem unique in American agriculture.

"One of the heartening events to emerge from the cranberry misfortune of last year was the manner in which the nation's food industry worked to restore consumer confidence in the excellent food product," Benson said.

Seeks approval of fish flour for human use

The other Senator from Massachusetts — Leverett Saltonstall—is the man behind the recent announcement that the USDA and the Bureau of Commercial Fisheries will begin a joint study of Federal food and drug laws. Purpose: to see what changes are needed to permit unlimited and unrestricted sale of fish flour in the United States.

FDA will not approve deodorized fish flour for human consumption and although it may be exported, the label must state that the product is not sold for human consumption in the United States.

According to Massachusetts processors and Senator Saltonstall's office, the FDA's refusal to give its approval is probably based on esthetic grounds. Flour made from whole fish is not only fit for human consumption but is extremely rich in protein.

FDA STANDARDS

French dressing and salad dressing: Standard of identity is amended by adding the name "hydroxypropyl methylcellulose" at the end of the list of emulsifying ingredients permitted in amounts up to 0.75 per cent.

Cream cheese and neufchatel cheese: Definitions and standards of identity are amended by listing propylene glycol alginate as an optional ingredient permitted in amounts up to 0.5 per cent by weight.

Old King Cole is a merry old soul
And no wonder he feels that way
The foods and the cheeses that fill his bowl
Keep fresh with SORBISTAT®-K!

FOODS STAY FRESH and "fit for a king" far longer when protected with SORBISTAT-K (potassium sorbate, Pfizer). This safe, efficient inhibitor of mold and yeast growth has little or no effect on the taste, and is proving highly successful in a variety of modern food products.

Some examples: fresh fruit cocktails ▫ high moisture cake ▫ cake fillings and icings ▫ fruit pie fillings ▫ cheeses ▫ fountain fruit syrups ▫ chocolate syrups ▫ prepared salad ▫ pickles ▫ dietetic jams and jellies ▫ smoked and pickled fish ▫ wine ▫ dried fruits.

SORBISTAT-K is readily soluble in water. You can prepare up to 50% solutions for sprays, dips and metering.

FOR APPLICATIONS WHERE WATER SOLUBILITY IS NOT A FACTOR Pfizer now offers new, improved SORBISTAT® (sorbic acid, Pfizer). SORBISTAT is a free-flowing product that dissolves readily in oil and fat media and can be mixed easily in dry form with other dry food ingredients. It has an extremely low moisture content.

Please send me Technical Bulletin #101, "Sorbistat®—Sorbistat®-K" FP
NAME_____
TITLE_____
COMPANY_____
ADDRESS_____
CITY_____ STATE_____

Science for the world's well-being

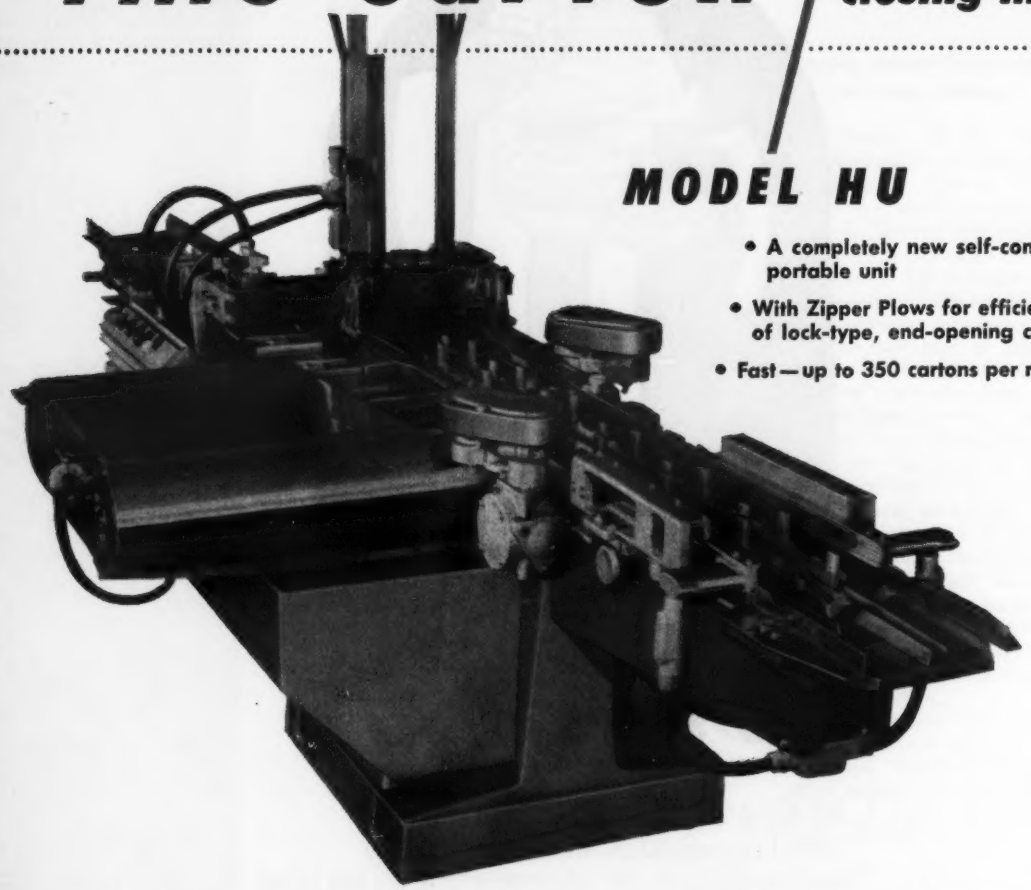
Quality Ingredients for the Food Industry for Over a Century

Pfizer

Chas. Pfizer & Co., Inc., Chemical Sales Division, 630 Flushing Ave., Brooklyn 6, N. Y.
Branch Offices: Clifton, N. J.; Chicago, Ill.; San Francisco, Calif.; Vernon, Calif.; Atlanta, Ga.; Dallas, Tex.; Montreal, Canada

NEW fmc carton set up filling & closing machine

MODEL HU



- A completely new self-contained portable unit
- With Zipper Plows for efficient closing of lock-type, end-opening cartons
- Fast—up to 350 cartons per minute

Simply plug it in, fill the carton feed magazine with flat cartons, flip the "start" switches, and your FMC Model HU Carton Handling Machine takes over—giving you one of the smoothest high speed automatic machine operations in your entire plant.

No other carton handler—packaging such products as pies, frozen dinners, ice cream cakes and pizza pies — gives you all these advantages:

1. **High speed** in continuous, automatic operation—up to 350 cpm, depending on product.
2. **Panel-board controlled** for low cost, one man operation.
3. **Trouble-free operation** and long machine life—this is ruggedly designed and precision constructed equipment.
4. **Portable** for roll-around positioning in various working areas.
5. **Versatile**—engineered for quick and easy adjustment to handle a variety of products requiring carton dimensions ranging from 6⅜" to 14" long by 3" to 10½" wide, flaps open.
6. **Sanitary, easy to clean**—constructed of stainless steel and aluminum, and to NEMA 4 Electrical Code.

You're sure to want complete information on this outstanding FMC unit. Write today, or ask your FMC representative to call.

Putting Ideas to Work

FOOD MACHINERY AND CHEMICAL CORPORATION
Canning Machinery Division
General Sales Offices:
WESTERN: SAN JOSE, CALIF. • EASTERN: HOOPESTON, ILL.

6770 on Reader Service Slip.

association news

Ervin L. Peterson, Assistant Secretary of the US Dept. of Agriculture since 1954, has been named executive director of the **Milk Industry Foundation,** Washington, D.C. He succeeds Richard J. Werner, who retired at the end of May.

Formation of an advisory committee to assist the directorate in a long-range planning program has been announced by **National Live Stock and Meat Board.** Advisory group consists of **Earl Butz,** Dean of Agriculture, Purdue; **J. Earl Coke,** vice president, Bank of America; **Herrell DeGraff,** Babcock professor of food economics, Cornell; **Homer Davison,** president, American Meat Institute; **Charles Hobbs,** head, Dept. of Animal Husbandry, University of Tennessee; **Don Parsons,** executive director, Super Market Institute.

Dr. C. Olin Ball, chairman of the Department of Food Science in the College of Agriculture, Rutgers University, announces that his Department is offering a new graduate program in packaging. Heading this phase will be **Dr. Edward A. Nebesky,** professor of food science.

Irvin A. Hoff has resigned as administrative assistant to Sen. Warren G. Magnuson of the State of Washington to accept appointment as executive director of the **United States Cane Sugar Refiners' Assn.,** Washington, D.C.

In addition to renewing seven projects, **American Dairy Assn.** has initiated four new product and nutrition research projects. Latter include: "Spray Drying of Natural Cheese," Michigan State University; "Influence of Fluorescent Light on Flavor and Vitamin Losses in Milk in the Grocery Store," University of California; "Keeping Quality and Palatability of Consumer Packaged Cheese," The Ohio State University; "Factors Affecting Bitter Flavor Development in Cottage Cheese in Market Channels," V.P.I.

plants companies personalities

Frank E. Glotfelty, a vice president and director and a 40-yr veteran with **Corn Products Co.,** has been appointed

F. E. Glotfelty

R. C. Wheeler

executive assistant to the chairman. Succeeding him as vice president-manufacturing is **Robert C. Wheeler,** most recently vice president-organization planning and public relations.

Dr. Imri J. Hutchings, manager of research, H. J. Heinz Company, and president of the Institute of Food Technologists, has been appointed to the Science and Advisory Committee of Duquesne University, Pittsburgh, Pa.

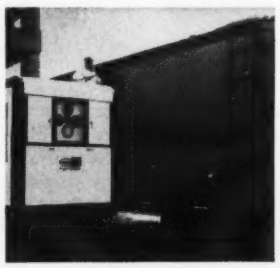
Appointment of **L. Robert Strong** as technical director has been announced by **Diamond Crystal Salt Co.,** St. Clair, Mich. Strong previously was responsible for production supervision and quality control at Kroger Co.

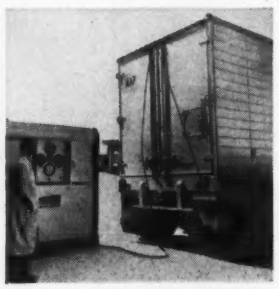
In its first acquisition of a going American concern for the purpose of diversification, **H. J. Heinz Company** has bought **Reymer & Bros. Inc.,** 114-yr-old pioneer Pittsburgh firm which now manufactures fruit-base drinks. P. Benjamin Grosscup Jr., Reymer president, will continue in his executive capacity for the new autonomous Heinz division, whose marketing activities will be expanded nationally.

In a major diversification move into the processed foods field, **United Fruit Co.,** Boston, has acquired **Liana Incorporated,** San Carlos, Texas — the first commercial freeze-dry food operation in the US. According to Liana's new president, **J. B. Harris,** head of United Fruit's department of

Refrigerate
MEAT, DAIRY, FRESH AND FROZEN FOOD PRODUCTS
instantly

...WITH PURECO CO_2 "BLAST CHILLING"





Drops temperature in minutes instead of hours.

The Pureco CO_2 *Blast Chilling* process accomplishes in minutes what mechanical units take hours to do. Pureco carbon dioxide liquid sprayed into the truck or railroad car reduces interior temperatures to sub-zero almost instantly. Six to seven hour pre-cooling periods are cut to minutes . . . after loading pull-down periods of two to four hours are eliminated. Product temperatures remain constant.

Blast Chilling Cuts Cost on Road, Too!

Blast Chilling flushes out the warm moisture-laden air and replaces it with cold dry vapor, thus mechanical units do not "ice up"—operate far more efficiently.

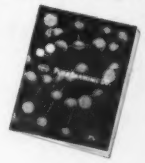
Shortened pre-load and after-load cooling periods, plus far more effective road operation add up to big savings on fuel and maintenance.

No Special Equipment is Needed.

Pureco CO_2 *Blast Chilling* needs no special equipment. It acts as an auxiliary to your truck or car's normal refrigeration system . . . mechanical units, hold-over systems or "DRY-ICE".

Have a trial Blast Chilling demonstration.

Pureco would like to demonstrate *Blast Chilling* to you in *your plant* under *your working conditions* . . . with no obligation on your part. Call your local Pureco representative for details or write:



New Pureco booklet "How Carbon Dioxide Serves You". Write for free copy.

See us at the A.B.C.B. Show in Detroit, Nov. 14-17, Booth No. 422

PURECO CO_2

PURE CARBONIC

Pure Carbonic Company, A Division of Air Reduction Company, Incorporated
Nation-Wide Pureco CO_2 Service-Distributing Stations in Principal Cities
General Offices: 150 East 42nd Street, New York 17, N.Y.

AT THE FRONTIERS OF PROGRESS YOU'LL FIND AN AIR REDUCTION PRODUCT

6771 on Reader Service Slip.

INSTANT STARCHES

FOR READY-MIXED SPECIALTIES

TURN OFF THE HEAT!

You name it! Cocktail dips, meat sauces, chiffons, chocolate milk drinks, fruit toppings—any dehydrated mix from soup to dessert can be thickened and stabilized with Instant Starches from National.

These new pre-gelatinized starches eliminate cooking, prolonged stirring, cooling. Housewife or chef, you simply add liquid to ready mixed specialties and stir. Another outstanding convenience in modern day specialty foods.

Instant Starches from National give every effect from glossy, crystal clear toppings to creamy homogeneous sauces. They even act as a freshener for cakes baked from mixes. We'd be glad to make recommendations. Just contact your nearest National office.

National STARCHES

NATIONAL STARCH and CHEMICAL CORPORATION

750 Third Avenue, New York 17 • 3641 So. Washtenaw Avenue, Chicago 32 • 735 Battery Street, San Francisco 11

And All Principal Cities in the United States, Canada, England and Mexico

6772 on Reader Service Slip.

plants companies personalities

Industrial Operations and director of the company's diversification activities, Liana's freeze-drying activities, which currently are confined to shrimp, may be expanded to include sea foods, fruits and vegetables and various formulated foods, including sauces. United Fruit has formed a subsidiary company — United Fruit and Food Corporation — to direct operations of Liana Corp. and any future acquisitions.

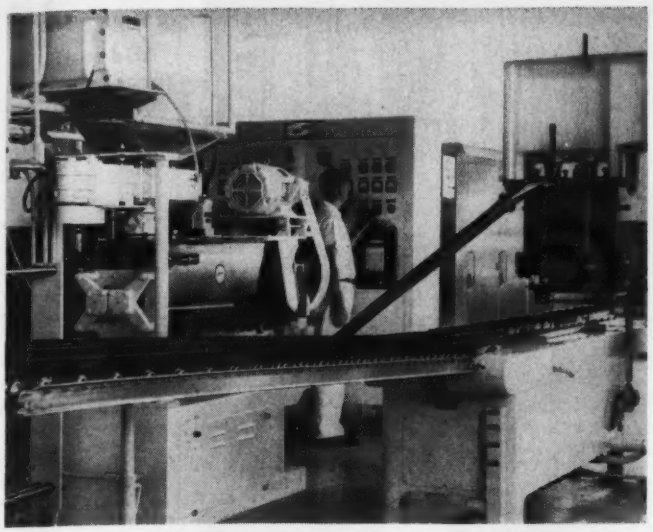
Edward M. Scheu, Jr., former president of Diamond Match Co. Division of Diamond National Corp., has joined **Thomas J. Lipton, Inc.**, Hoboken, N.J., as vice president-Development. He will be responsible for development of new products and new product lines, and acquisitions.

E. M. Scheu, Jr.

W. R. Dorsey

Vacu-dry Co., Oakland, Calif., has promoted **William R. Dorsey** from vice president in charge of research and development to vice president in charge of operations. In addition to directing manufacturing operations at all three Vacu-dry plants, he will continue to be responsible for the policy direction of research activities.

Coca-Cola Company will acquire **Minute Maid Corp.** through an exchange of stock, subsequent to approval of the merger agreement by the stockholders of both companies — probably in December. Minute Maid, which will continue operating with its present management, produces frozen concentrates and fruit juices, and also markets single-strength juices, ades and bases. The company is a major citrus grower, and, through its Tenco division, produces instant coffee (sold mainly to regional coffee distributors and chain stores) and instant tea.



Centralized control is one of the features of the continuous mix process; note control panel behind operator in center of photo. Flour and liquid ingredients are continuously blended and mixed in short trough which is in front (left) of operator, then pumped to continuous dough developer (right) from which it is scaled into pans. This accurately controlled system of continuously mixing dry and liquid ingredients might very well be adapted to other food processing operations

Continuous dough mixing

research and development on full production scale

DO YOU WANT to see how your pet formulas can be adapted to the continuous mix process? At the new Do-Maker Research & Development Center, Baker Process Company, Belleville, N. J., the bread you want to make will be baked, sliced, and wrapped on a production-scale basis.

The center is completely equipped with a 6-rack proofer, 45 ft tunnel oven, slicing and wrapping equipment, and a standard continuous Do-Maker unit with a capacity of 6000 pounds of dough per hour.

So well has flexibility and control been engineered into the system that steady-state operating conditions are fully achieved on short runs. Only 500 lbs flour is required for a complete run.

Since on the average about four runs are required to demonstrate the optimum operating conditions for a specific experimental objective, a ton of flour is usually considered as the amount required per project.

As an additional service, it is planned that the commercial size experimental unit will be used as an initial training tool for personnel of bakers who install the continuous dough making process in their shop.

Over 90 of these continuous Do-Makers have been installed. It is reported that the Do-Maker will pay for itself in about two years based on the savings in labor, more accurate scaling, elimination of ingredients that contribute to machinability, and elimination of dusting flour and trough grease.

Detailed information on the process as well as the characteristics of the bread it produces are available in a 36-page fully illustrated brochure.

6773 on Reader Service Slip.

YOUR CHICKEN DINNER AND FRICK REFRIGERATION

• From the farm to your fork, the chicken that's served to your family has been kept fresh by refrigeration.

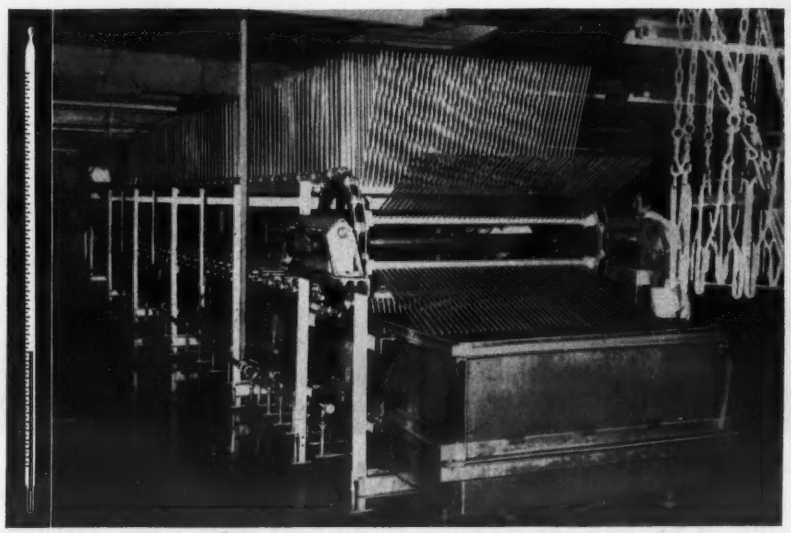
The Frick Company, pioneers in refrigeration, has developed an economical process that is years ahead of other methods of chilling freshly killed birds. Using a continuous flow of cold water instead of costly ice, the Frick system cools the birds to 36 or 37 degrees—not just the minimum requirement of 40—thereby preserving freshness and locking in flavor.

Frick's ability to design and install quality refrigeration for processing, packaging and storing foods of *all* types is recognized by engineers throughout the world.

No matter what *your* refrigeration or air conditioning problem is . . . for beans or beer, poultry or peaches, pharmaceuticals or farm-fresh apples . . . Frick offers depend*ability*.

If your business requires refrigeration or air conditioning in *any* phase of its operation, a Frick engineer will be happy to discuss it with you at no obligation.

FRICK COMPANY, Waynesboro, Pennsylvania



• Here's a Frick Counter-Flow-Continuous ("C-F-C") Poultry Chiller, one of four in operation at Holly Farms Poultry Processing Plant, Wilkesboro, North Carolina.

The continuous flow of water passes through only once, with no recirculation, and the chiller operates continuously instead of in batches.

Savings up to ¼c per pound are realized by using the Frick "C-F-C" chiller when compared to the use of ice. Figure the money saved at Holly Farms, which processes 9,600 birds an hour, using Frick refrigeration equipment exclusively.

6774 on Reader Service Slip.

that's interesting

Acid test!

Vinegars from citrus concentrates are the fruits of recent efforts by Florida Citrus Experiment Station and the Florida Citrus Commission. Heretofore oranges, tangerines and grapefruit have not been used in commercial vinegar production because of a natural sugar content too low to yield a minimum four per cent acetic acid.

However, the frozen concentrates of the juices provide virtually any desired amount of sugar concentration. (*Western Fruit Grower*, August 1960)

Canned wildlife!

Readers interested in a striking new dish might try Rattlesnake Meat In Patty Shells or Rattlesnake Meat Croquettes.

Additional menu suggestions, and complete tasty recipes, are available from Ross Allen's Reptile Institute, Silver Springs, Fla.

For more information on product at left, circle 6775 see information request blank opposite last page.

A BOX IS A BOX UNLESS YOU BUILD OR BUY THEM

Then it assumes new meaning. If you build them, terms like finger jig, fluffing, splicing on the fly, kiss impression, and dancing roll become meaningful. If you buy them, compression, impact, drum, drop, and tumbling tests are important criteria. But to consumers, a box is a box. Your customers are only aware of the products they buy being intact, and undamaged, and scratch-free. For 39 years Hoerner has been conscientiously designing, and manufacturing corrugated containers for companies who like satisfied customers.

HOERNER BOXES, INC.

CORRUGATED PACKAGING SPECIALISTS FOR MID-AMERICA

GENERAL OFFICES: 600 Morgan Street, Keokuk, Iowa • PLANTS: Fort Smith and Little Rock, Ark.; Des Moines, Keokuk and Ottumwa, Iowa; Danville, Ill.; Minneapolis, Minn.; Tupelo, Miss.; Springfield, Mo.; Sand Springs, Okla.; Sioux Falls, South Dakota; Fort Worth and Mission, Texas • ASSOCIATE: Cajas y Empaques Impermeables, S.A., Mexico City D.F., Mexico

Seach unit in operator's hand is moved from steer's backbone along last rib; sends out and receives sound waves at frequency of 1.6 megacycles to measure depth of fat and muscle interface

"Sees" under hide to measure meatiness of live animals

Ultrasonic method for accurate indexing of muscle and fat approaches practicability

The instrument for measuring leanness of meat in live animals is still in the development stage insofar as commercial applications are concerned. However, experimental results achieved to date with this evaluation tool have been quite encouraging.

Instrument operates on principle that ultrasonic sound waves which pass through living tissue are reflected back each time there is a change in the nature of the living tissue, e.g. from hide to fat, from fat to meat, from meat to fat etc.

Reflected signals are transduced into electrical signals which are amplified and appear on a cathode-ray tube where they are read as depth of the interface.

To secure a permanent record, photos of the cathode-ray tube pattern can be made with a camera. By synchronizing movement of search unit on animal's back with camera, cross sectional record of animal is made.

From the photographs, it is possible to distinguish the external fat layer, the spinose process of the backbone and the rib-eye muscle.

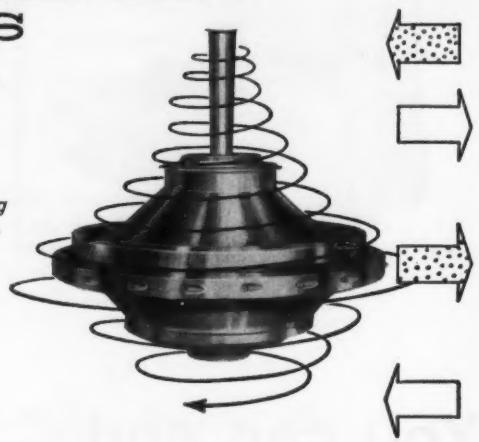
Ultrasonic instrument, which has also been tested on hogs, was presented by Dr. J. R. Stouffer, Assoc. Professor, Dept. of Animal Husbandry, Cornell University, at the 55th meeting of the American Meat Institute. END

Process Trends from **DORR-OLIVER**

A SERVICE TO THE PROCESSING INDUSTRIES

THE CENTRIFUGE TAKES OVER

A long-neglected equipment item is developing into a giant that is starting new trends in processing operations



Although the centrifuge has been with us for a long time, its full potentialities are only now being realized in the processing field. Partly, this is due to the increasing demand for faster, more precise methods of separation and classification, adaptable to continuous, automatic operation. More particularly, it is due to radical new developments in the centrifuge itself.

Centrifuges have now become so versatile in operation and have advanced so much in size, power and capability that opportunities for profitable application are virtually unlimited. They are replacing filters, settling tanks, screening and other separation and classification equipment. In many cases, they are cutting days off processing time. Important, too, since the centrifuge substitutes horsepower for size, is the greatly reduced floor space requirements and the smaller amount of critical material needed when handling highly corrosive solutions.

Dorr-Oliver has taken a leading part in the development of these newer, more versatile and more powerful units. An example is the high speed, high pressure Merco® centrifuge for operation at elevated temperatures. A successful application is in separating the catalyst from the polymer in the production of the new high density polyethylene.

Features of Dorr-Oliver design are the overhead bearing and drive which remove some of the limitations of conventional units and the revolutionary return flow principle that permits concentrating, washing, clarifying, classifying and recovery of soluble values at pressures up to 150 psi. Probably the largest centrifuge now in operation is a Merco unit. Rotor speeds up to 3300 rpm and capacities up to 600 gpm are possible. Smaller size, specialized units, among them the Mercone® Screening Centrifuge, are finding application in the food and pharmaceutical industries.

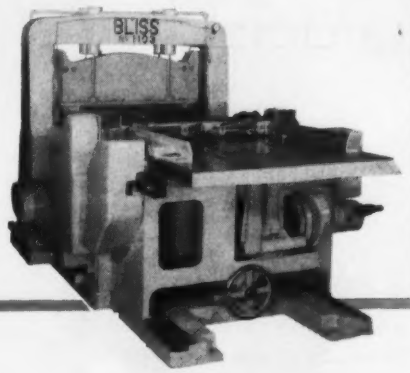
To those interested in the possibilities of centrifugation, Dorr-Oliver offers a wealth of information. For investigation and evaluation, pilot plant models are offered on a sale or rental basis. Just drop a line to Dorr-Oliver Incorporated, Stamford, Connecticut.

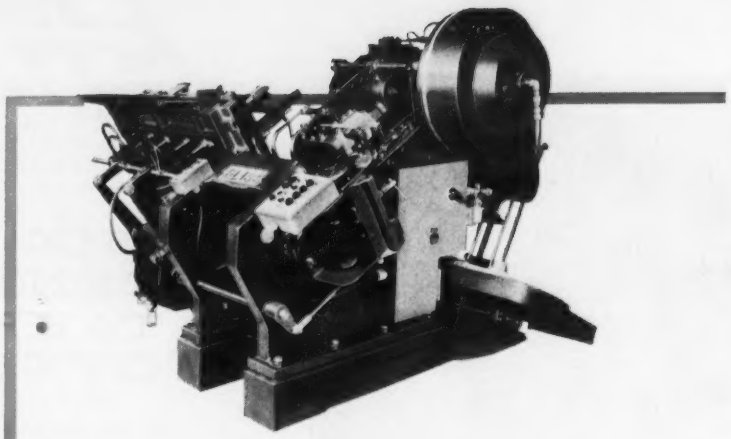
Dorr-Oliver offers a wide range of equipment, methods and complete systems for the processing industries. Operations include:

ROASTING • DRYING • CALCINATION • CLASSIFICATION • THICKENING • SCREENING • FILTRATION • CLARIFICATION • WASHING • AGITATION • CENTRIFUGATION • ION EXCHANGE • PUMPING

6776 on Reader Service Slip.

New #1103 Automatic Scroll Shear offers highest production rate ever, shears both lithographed or plain sheets up to 36" square. There's no idle stroke... every stroke is a cutting stroke. First table retracts to permit regrinding of cutters with a conventional cutter grinder without taking them off.

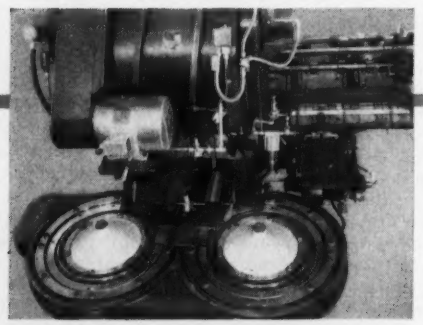




High speed #1831 Strip Feed Press blanks and forms can ends up to 404 diameter in double dies. Speeds range from 250 to 325 s.p.m. producing up to 600 or more ends a minute.

You can end CAN END production problems with these Bliss machines

(More Bliss end lines are in use than any other make)



Double end #20 Automatic Curler curls ends from 2" to 4¼" diameter; is designed for use with #1831 Strip Feed Press. Independently motor-driven, it does not rely on the press for its drive.

These machines incorporate many refinements in designs that have been thoroughly proved in production over the last four years. Write today for detailed information.

BLISS SINCE 1857

E. W. BLISS COMPANY · Canton, Ohio

BLISS is more than a name—it's a guarantee

PRESSES • ROLLING MILLS • ROLLS • DIE SETS • CONTAINER MACHINERY • CONTRACT MFG.

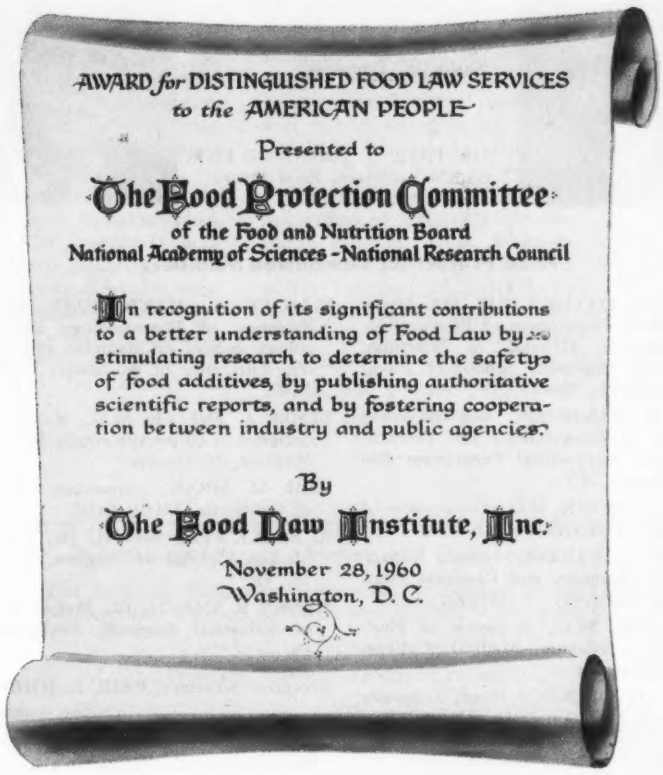
6777 on Reader Service Slip.

THE MAGAZINE OF APPLIED TECHNOLOGY
FOR MEN WHO MANAGE
FOOD PROCESSING
NOVEMBER 1960
VOL. 21 NO. 11

Away from the limelight, the National Research Council's Food Protection Committee quietly probes the basic problems in . . .

Critical evaluations of food additives

FP STAFF


AWARD for DISTINGUISHED FOOD LAW SERVICES
to the AMERICAN PEOPLE
Presented to
The Food Protection Committee
of the Food and Nutrition Board
National Academy of Sciences - National Research Council
In recognition of its significant contributions to a better understanding of Food Law by stimulating research to determine the safety of food additives, by publishing authoritative scientific reports, and by fostering cooperation between industry and public agencies.
By
The Food Law Institute, Inc.
November 28, 1960
Washington, D. C.

". . . for distinguished food law service to the American people . . . significant contributions to a better understanding of food law by stimulating research . . . publishing authoritative scientific reports . . . fostering cooperation between industry and public agencies."

Laudatory prose of this kind is characteristic of salutatory awards, but it's particularly apt and appropriate as it appears this month on a distinguished service scroll the Food Law Institute is presenting to the National Research Council's Food Protection Committee.

The committee, a largely unsung workhorse unit within the Food and Nutrition Board of the National Academy of Sciences-National Research Council, is being honored by FLI at ceremonies in Washington, D.C., Nov. 28. FLI, by so doing, spotlights the operations of an important industry-born food additive fact-finding and advisory group that's been at work for 10 years now developing and publishing critical evaluations of the effects of food additives.

The importance of these evaluations has, of course, multiplied tremendously since passage of the 1958 Food Additives Amendment.

FPC's origin, significantly, goes back to a time when industry's own concern over the long-range effects of pesticidal residues and additives was the primary impetus to studies of their effects on food safety.

It was in 1948 that this concern, felt by food technologists throughout the industry, led the Food and Nutrition Board to set up an *ad hoc* committee on food protection. This committee's job was to determine the hazards to public health posed by the increased use of pesticides and food additives.

After a year of much conferring with federal and private authorities, the committee concluded (1) that unlimited and inexpert use of insecticides could conceivably present a public health hazard, (2) that food production and preservation needs nonetheless required continued use of insecticides, plus an increased number of food additives, (3) no approved standards existed for determining the hazards involved, and (4) more scientific data was needed to develop such standards. The Food Protection Committee was envisioned after further study of the problems.

The committee itself came

In distinguished company . . .

Receiving the Food Law Institute's outstanding service award puts the Food Protection Committee in the distinguished company of these previous FLI award recipients:

- Food and Drug Administration
- Meat Inspection Branch, Agricultural Research Service, USDA
- Mrs. Harvey W. Wiley
- Dr. Carlos A. Grau of Argentina
- Sen. Lister Hill (Ala.)
- Rep. John E. Fogarty (R. I.)

Critical evaluations of food additives continued

DR. WILLIAM J. DARBY, Chairman, Food Protection Committee; Head, Department of Biochemistry and Director, Division of Nutrition, Vanderbilt University of Medicine, Nashville, Tennessee

DR. PAUL E. JOHNSON, Executive Secretary, Food Protection Committee

Food Protection Committee Members

WILLIAM J. DARBY,* M.D., FPC Chairman; Head, Department of Biochemistry and Director, Division of Nutrition, Vanderbilt University School of Medicine, Nashville, Tenn.

DAVID B. HAND, FPC vice chairman; Division of Food Science and Technology, State Agricultural Experiment Station, Geneva, N.Y.

PAUL R. CANNON, M.D., Department of Pathology, University of Chicago.

HERBERT E. CARTER,† Head, Department of Chemistry and Chemical Engineering, University of Illinois.

J. M. COON, M.D., Professor of Pharmacology, Jefferson Medical College, Philadelphia, Pa.

GEORGE C. DECKER,* Head, Economic Entomology Section, State Natural History Survey, and Illinois Agricultural Experiment Station, Urbana, Ill.

ELLIOTT A. MAYNARD,*† Associate Professor of Pharmacology and Toxicology, School of Medicine and Dentistry, University of Rochester, Rochester, N.Y.

JAMES A. MILLER, M.D., Mcardle Laboratories, University of Wisconsin, Madison, Wisconsin.

EMIL M. MRAK, Chancellor, University of California, Davis, Calif.

R. BLACKWELL SMITH, JR., President, Medical College of Virginia, Richmond 19, Va.

HENRY F. SMYTH, JR., Mellon Institute of Industrial Research, Pittsburgh 13, Pa.

Executive Secretary, PAUL E. JOHNSON,

*Members of the Committee since its inception in 1950.
†Immediate past member, i.e., to summer, 1960.

into being in 1950 as a segment of the Food and Nutrition Board of the Research Council. Its objectives: "to provide critical evaluation of information concerning the safety for use in foods of chemical additives; to stimulate the acquisition through research of information adequate to establish the safety of additives for use in foods; to foster continued cooperation between industry and agencies of the public in assuring the wholesomeness and safety of the food supply."

These are general objectives. The specific objectives FPC works toward emerge out of its constant contact with its all-important Liaison Panel which, through its Industry Committee, keeps FPC in tune with both the immediate and long-range food safety problems. The panel, a sort of gyroscope for the general direction of FPC, consists of representatives from four interested groups: industrial contributors who support activities of FPC, trade associations and foundations, government control and research organizations, and scientific and technical societies.

Financial support for FPC's activities come from the food industry and its components—the food, packaging, and chemical industries, commercial laboratories, and individuals. This financial aid is given to the National Academy of Sciences of the National Research Council, and provides funds for FPC's secretarial staff, for meetings of the committee, and for its publishing work. The committee members themselves serve without compensation.

But, while FPC receives its financial support from industry—see Industry's Role, facing page—and regularly maintains liaison with it, the committee itself is solely responsible for its final judgments, conclusions, and the preparation of its reports. It is subject only to the Food and Nutrition Board of the National Research Council for its public releases.

This whole arrangement of independent research supported by private financing is entirely in keeping with the organization of the parent National Research Council itself. NRC, set up in 1916 as an affiliate of the National Academy of Sciences, was constituted to provide a group of scientific counselors to both the government and industry, but administratively free of both.

For FPC, this pattern has proven an ideal arrangement for marshalling the priceless talents of top scientists to work without compensation in the public interest.

FPC's investigative workload has fallen mainly into four categories, each handled by a subcommittee headed by a committee member. Carcinogenesis is handled by the subcommittee formerly headed by Herbert E. Carter and now headed by James A. Miller, food technology is handled by David B. Hand, pesticides by George C. Decker, and toxicology by J. M. Coon.

At the helm of the FPC is a ten-man committee, presently chaired by William J. Darby, Head, Department of Biochemistry and Director, Division of Nutrition, Vanderbilt University School of Medicine, Nashville, Tenn.

Dr. Darby is one of two committee members who have been serving on the committee since its inception in 1950 (see box above).

First fruits of FPC's labors were borne in December, 1951, when it published "Use of Chemical Additives in Foods."

Recognizing that a great deal of misunderstanding regarding the food additives problem even then existed, this report pointed out that the constituents of food themselves are chemicals which "may be classified as carbohydrates, fats, proteins, minerals, water, and accessory factors such as vitamins.

"In addition to the natural variations in chemical composition of foodstuffs," the report observed, "chemicals may be incorporated during the growing or during the storage and processing of the food. These chemicals may be described for convenience as 'additives'." The statement went on to explain why chemical additives are used, the necessity for the use of pesticides, and the benefits to be obtained therefrom.

From this initial report, FPC went on in 1952 to publish "Safe Use of Chemical Additives in Foods," setting forth ground rules for evaluating the safety of chemical additives and the hazards posed by use of pesticides.

Still other publications by FPC:

- "The Safety of Mono- and Diglycerides for Use as Intentional Additives in Foods," 1952.
- "The Safety of Polyoxyethylene Stearates for Use as Intentional Additives in Foods," 1953, an evaluation of available evidence concerning the safety of the specified emulsifying agents.
- "Annotated Bibliography of Analytical Methods for Pesticides." Section I, published in 1952, deals with methods for aldrin and dieldrin, benzene hexachloride, chlordane and heptachlor, and DDT. Section II, published in 1954, deals with methods for insecticides, fungicides, herbicides, and rodenticides.
- "Principles and Procedures for Estimating the Safety of Intentional Chemical Additives in Foods," 1954.
- "The Safety of Artificial Sweeteners for Use in Foods," 1955.

Industry's Role — The Liaison Panel

FPC's Liaison Panel exists to provide effective exchange of views among groups concerned with problems before FPC. Groups represented on this panel are:

- *Industries contributing funds to FPC*
- *Commercial laboratories and consultants*
- *Trade associations and foundations*
- *Government agencies*
- *Scientific and technical societies*

At present, some 150 companies contribute funds to support FPC's activities and these companies are entitled to representation in the Liaison Panel. Their representatives elect an Industry Committee that constitutes the major communications medium between the contributing industries and FPC.

The amount that companies contribute is, under present arrangements, determined by the contributors themselves. But now under consideration is a minimum of $250 a year to qualify a company for representation on the Liaison Panel.

Readers interested in additional information on becoming a member of the contributing industry group should address their inquiries to Mr. Lee Burt, Chairman of the Industry Committee of the Liaison Panel, c/o Hercules Powder Company, 940 Market St., Wilmington 99, Delaware.

activity. For example, on Dec. 8, FPC is sponsoring a symposium on Science and Food: Today and Tomorrow, in Washington, D.C.

Purpose of this symposium is to make available to the public valid information on the contributions of science, including those of chemistry, to provision and maintenance of the nation's food supply (see program, box below).

In addition to its research, publishing, and information programs, FPC regularly acts in an advisory capacity, lending its specialized intelligence to the deliberations of other National Research Council groups, government bodies and agencies, and the industry in general.

Thus, FPC, guided by liaison with the industry, working through its specialized subcommittees, and communicating through its Liaison Panel, is roundly fulfilling the task set before it a decade ago—"provide critical evaluation... stimulate acquisition of research information . . . foster cooperation between industry and public agencies in assuring the wholesomeness and safety of the food supply."

This independent fact-finding group of scientists has already charted areas wherein the food industry, FDA and public health authorities have developed a common viewpoint. As further facts are disclosed by scientific research, the proper regulatory actions will become much clearer. END

- "The Use of Chemical Additives in Food Processing," 1956, an exposition of technological reasons for using chemical additives in foods and a compilation of additives used in the U.S., commonly referred to as the "Green Book."
- "The Relation of Surface Activity to the Safety of Surface Active Agents in Foods," 1956, a study to determine whether surface activity *per se* is a sufficient criterion for the safety of a chemical for use in food.
- "Safe Use of Pesticides in Food Production," 1956, a description of the steps involved in developing pesticides and a statement of the procedures necessary for evaluating the safety of pesticides for use in food production.
- "Insignificant Levels of Chemical Additives in Food," 1958, a statement of the concept that toxic substances can occur in food at levels inconsequential to public health.
- "Food Packaging Materials —Their Composition and Uses," 1958, a description of materials used for packaging foods and a discussion of functions of the materials and their components.
- "The Safety of Polyoxyethylene (8) Stearate for Use in Foods," 1958.
- "Problems in Evaluating the Carcinogenic Hazard from Use of Food Additives," 1959.
- "Principles and Procedures for Evaluating the Safety of Food Additives," 1959.
- "Safety of Mono- and Diglycerides for Use as Intentional Additives in Foods" (with special note on the safety of glycerol mono- and dilaurates), 1960.

These publications, most of which are available from the National Academy of Sciences, National Research Council, represents FPC's contribution to date to the solution of the food additives problem.

In addition, the committee is currently working on four new projects: (1) revision of "The Use of Chemical Additives in Food Processing," (2) study of possible ways of improving interpretation of toxicological data, (3) study of need for development of a "Food Additive Codex," and (4) preparation of statement on functions of food additives.

Regular symposiums on timely food protection subjects, to promulgate wider appreciation of factors involved in food safety, is another FPC

Science and Food: Today and Tomorrow

Food Protection Committee Symposium for members of the Liaison Panel (not an open meeting), Dec. 8, 1960, Washington. D.C.

Chairman: D. W. Bronk
President, National Research Council

Keynote address	W. J. Darby, Head, Department of Biochemistry and Director, Division of Nutrition, Vanderbilt University School of Medicine, and Chairman, Food Protection Committee
Technologic revolution in agriculture. Contributions of science. Contrasts between U.S. and developing countries	J. G. Harrar, Vice President, Rockefeller Foundation
Contributions of science to supplying food for a changing world	David Dawson, Vice President, E. I. du Pont de Nemours & Company
Relation of modern food science to nutrition	C. G. King, Executive Director, The Nutrition Foundation
What modern food science could mean to the developing countries	Nevin S. Scrimshaw, Director, Institute of Nutrition for Central America and Panama
Food and health: Medical aspects of the modern food supply	Charles S. Davidson, Thorndike Memorial Laboratory, Boston City Hospital
The meaning of "safety" as regards food additives	R. Blackwell Smith, Jr., President, Medical College of Virginia
Applications of science in assuring safety of the food supply	George P. Larrick, Commissioner, Food and Drug Administration
How the food industry meets the demands of the consumer: Scientific applications to processing, storage, and packaging of foods	C. G. Mortimer, Chairman, General Foods Corporation

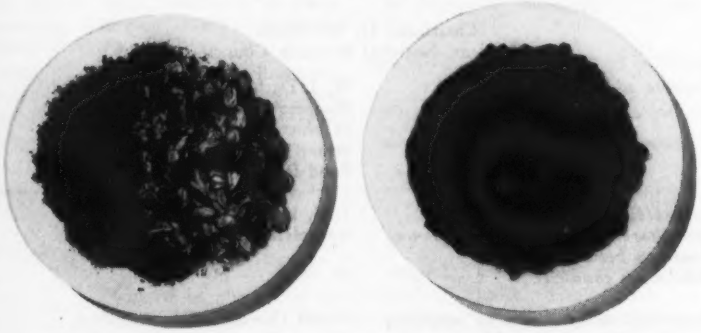
Industry interest mounts in

FREEZE DRYING

- **Production equipment as well as pilot-plant equipment becomes more widely available**
- **Test facilities on commercial scale as well as lab scale offered to food industry**

HOWARD P. MILLEVILLE
Editor

CHILI with BEANS



DEHYDRATED
Wt. 4.5 oz.

REHYDRATED
Wt. 18.0 oz.

Freeze dried precooked beef and beans plus seasoning make up the chili shown above. It rehydrates ready to serve in 10 to 15 minutes upon the addition of hot water. It is judged as far superior to the canned product and has had exceptionally high acceptance in Army feeding tests. (US Army photos courtesy QM Food & Container Institute)

Within the past year, several leading food processors have test marketed a variety of foods prepared by freeze drying. These include shrimp, coffee, instant soup mixes, steak, chicken, mushrooms, corn, and even fruits and green vegetables like celery. Many other products both raw and precooked have been successfully freeze dried in laboratory studies.

Quality of freeze dried foods is generally excellent and comparable to that of the product from which prepared. One use which is becoming important is in the formulation of new convenience food preparations.

WIDESPREAD INTEREST in freeze drying has become evident throughout the industry.

Unexpectedly large attendance at a recent 2-day meeting on the subject represented a "Who's Who of the Food Industry." This was the Military-Industry Conference in September sponsored by the Research and Development Associates Food and Container Institute for the Armed Forces.

Most newsworthy were the reports of equipment suppliers in this field. They now offer, in addition to a line of laboratory units, standard production equipment which can be tailored to each processor's use. These are described in detail in an equipment roundup on page 72.

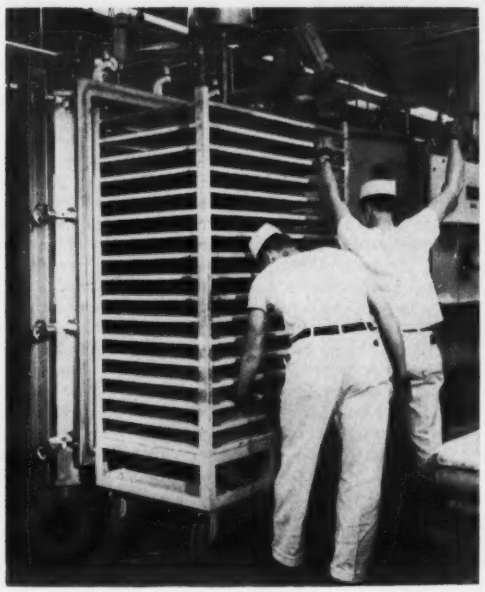
As experienced observers pointed out, there was no technological breakthrough discussed at this meeting which was not already well known. What then was the reason for the widespread interest that has come to exist in the industry?

Dehydrated foods rediscovered, that is, management in the food industry has finally become aware of the vast improvement that has been made in the processing of all types of dehydrated foods, raw and precooked . . . and of their possible market potential.

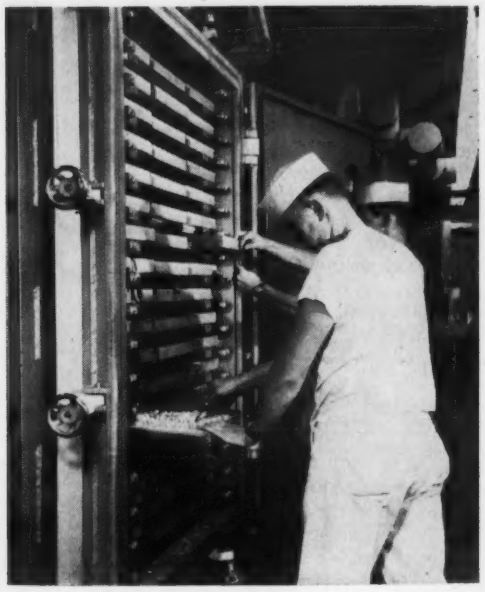
Quality dehydrated foods can be marketed without the necessity for refrigeration. Hence, their introduction into the commercial market is vastly simplified compared to that for new frozen foods. Another advantage is marked weight reduction, since practically all the moisture is removed.

Objectives of improved drying methods have been to avoid heat damage to the food during drying. Freeze drying achieves this objective by placing a frozen product under high vacuum and removing the ice by sublimation, that is, by direct conversion to vapor without an intermediate

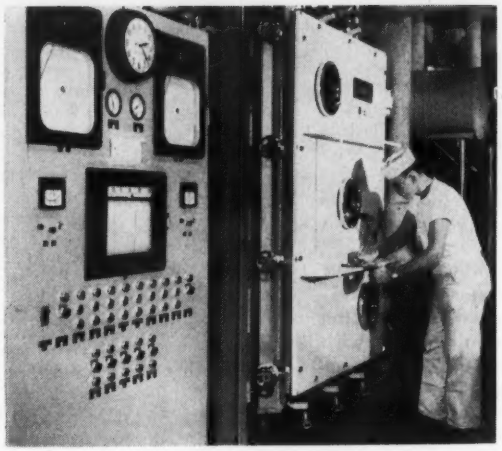
1



2



3



4

Freeze drying production operations at Thomas J. Lipton's Albion, N.Y., plant are shown here and on the cover. Three photos here show (1) trays of frozen mushrooms on a multi-tiered cart being removed from freezing room; (2) same trays being quickly transferred onto the shelves (plates) of the freeze dryer; (3) thermocouples being inserted into the mushrooms at four locations. In photo (4) operator standing in front of door of freeze dryer makes spot check of color and temperature of product during the drying. Thermocouple temperatures are automatically recorded on the control panel.

Overall view of operation on cover shows three of the freeze dryers which were built by F. J. Stokes Corporation; a fourth freeze dryer is currently being installed.

change to liquid.

Practically any product having a definite tissue structure can be freeze dried with little loss in natural quality after rehydration. Because of the porous structure of the freeze dried product, rehydration is fast. In fact, the term "instant dehydrated" is frequently applied to them, although minimum rehydration times are usually 5 to 10 minutes.

Cost bottleneck is the long drying time inherent in the process as presently carried out and the heavy investment required in equipment which must be designed for high vacuum operation.

Even when the cost is amortized over a 10-year period, it is still likely to be the dominant factor in total cost of producing a freeze dried product.

Processing costs mentioned by various equipment suppliers range from 4 to 6 cents per pound of water removed . . . with some projecting costs being lowered to the range of 2 to 3 cents.

However, experienced observers are somewhat skeptical of these cost figures, pointing out that they are based on idealized conditions not encountered in practice. Then, extra costs of protective packaging required have to be considered.

A realistic cost figure for producing and packaging a freeze dehydrated product is probably somewhere around 10 cents a pound (based on the weight of the reconstituted product).

To justify this expensive drying method, two important criteria have to be met, according to Edward Seltzer,* Chief Research Engineer of Thomas J. Lipton Co., Inc., which is now producing certain freeze dried food commercially (see accompanying photos).

"First, the freeze dried product has to be conspicuously better than when dried by other conventional methods.

"Second, the value of the dry solids in the raw material being processed has to be sufficiently high so that the freeze drying costs will be a reasonably small percentage of the final total costs."

We would add that freeze drying low-priced raw materials might be justified if important quality improvement in the final prepared food product of which it is a component is obtained.

The cost bottleneck was succinctly identified by Seltzer when he said: "There are

*Statements attributed to Edward Seltzer are taken from paper entitled "Some Efforts to Accelerate Freeze Dehydration," presented at the Military-Industry Conference, September, 1960.

two major mechanical developments that could enable Lipton and others promptly to expand our application of freeze dehydration.

"These are: (a) a sharp reduction in cost of conventional equipment so that low productivity associated with long drying cycles could be borne for many inexpensive commodities, and (b) a sharp reduction in drying cycles made possible by new technology in accelerating heat input without hazarding the frozen condition."

Single approach best if we follow the argument of Seltzer. At the present state of the art, it would appear to be sounder practice to specify relatively simple equipment and accept long drying cycles . . . yes, even to design the operation for long drying cycles.

Seltzer reports that for practical purposes there appears to be no difference in effective freeze drying capacity for different loading depths on its trays.** Hence, he suggests loading trays to a depth that will result in a convenient plant-time operating schedule.

Thus, operations of unloading, cleaning, and reloading could be done in one shift with the dryer on automatic operation overnight.

If the drying cycle were cut to say 7 hours with more costly equipment, we would need 3-shift operation to take advantage of it, unloading, cleaning, and reloading 3 times each 24 hours. Obviously such a scale of operations would not be justified except for large tonnage operations.

Low-cost approach is to experiment on a pilot-plant basis, and in this case the pilot-plant can be laboratory or commercial size as is described in more detail in the "Equipment Roundup" article on page 72.

**This conclusion applies only to materials in the form of uniform, discrete particles such as diced meat, when drying time required for two layers is twice that required for one layer. If the diced meat is firmly packed to interfere with the interstices which provide vapor release paths, the drying time is increased about 10%. If the particles are doubled in size, then the drying time would be increased about four times, since drying time is proportional to the square of the "diameter."

Theoretical considerations

TYPICAL DRYING CURVE (prepared by Vacudyne Corporation) shown on this page demonstrates how the rate of freeze drying changes with time. Note that most of the moisture is removed at a relatively high rate. Long drying times characteristic of freeze drying are caused by the slow drying rates encountered as the moisture content drops below 10%. Final moisture content required for quality stability at room temperature is around 2%.

Operating vacuum must be less than the vapor pressure of water over ice — 4.6 mm at 32 F and 0.96 mm, or about 1 mm at 0 F. Theoretical analysis of the freeze drying mechanism leads to the conclusion that maximum drying rate occurs in the region of about 1 mm, or 1000 microns, with only slight increase in rate as vacuum is increased.† Most freeze drying is done in the 100 to 1500 micron range.

At any operating vacuum, rate of freeze drying is limited primarily by the rate at which heat can be transferred into the product to vaporize its frozen moisture without its melting, and without damaging the product quality.

As the product dries, it assumes a porous structure not unlike balsa wood, and like balsa wood, is a poor conductor of heat.

To supply heat **uniformly** through the poor-heat-conducting dried exterior into the frozen moisture still remaining in the interior of product, various techniques of dielectric heating have been tried. To date such methods have not proved practicable.

Hence, in practice, heat is transferred by more common methods of conduction and radiation, usually by conduction from the top of the plate on which the product rests and by radiation from the bottom of the plate above it. (Plates are hollow and heating medium is circulated through them. Electrical heating is used in some pilot-plant units. Product is usually placed in flat trays, and then trays are placed on plates of freeze dryer.)

Contact between heating surfaces of the plate and product can be increased for more effective conductive heating by compressing the product between plates. Some of the commercial equipment made abroad uses this technique to cut freeze drying times in half. This equipment is described in some detail in the Equipment Roundup, which begins on page 72.

To determine optimum operating conditions for any specific application in a given make of freeze the maximum temperature of the heating medium that can be used without adversely affecting quality characteristics of the final product. As might be expected, this temperature varies during the course of the drying operation.

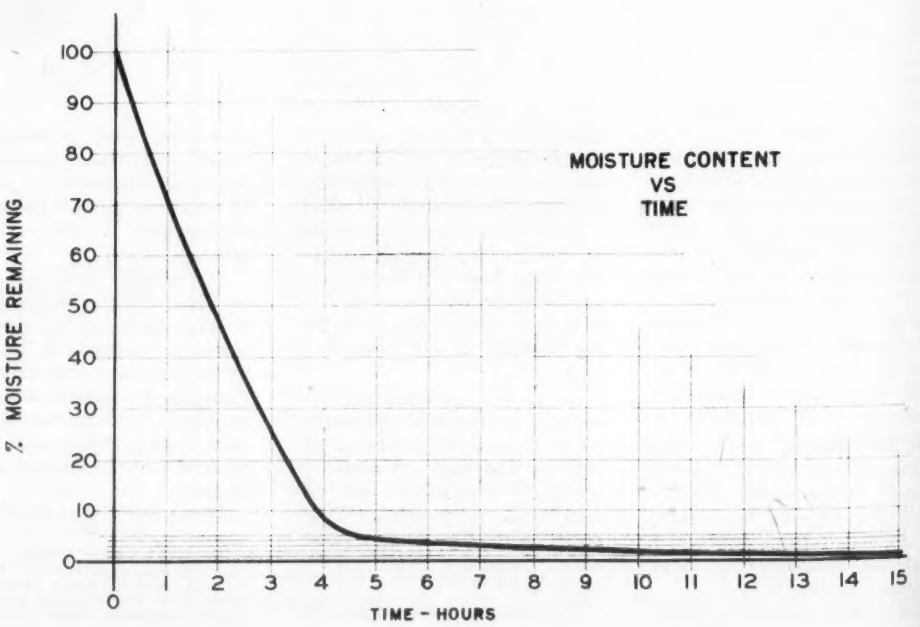
At start of the drying cycle, the heating medium must be kept cold to prevent surface thawing of the product. Since the (eutectic) melting point of the moisture in many food products is around 22 F, it might even be necessary to have the heating medium below 32 F during the loading operation.

As freeze drying proceeds and the porous structure on the product's exterior becomes set, temperature of the heating medium can be increased. Some commercial equipment is designed for gradually increasing temperature of the heating medium to as high as 280 F and then finishing the drying at temperatures as high as 140 F.

Split-cycle drying — freeze drying to set the porous structure and then completion of drying in a tunnel dryer (atmospheric air) has been proposed as one way of increasing capacity of the more expensive freeze dryers.

Ed Seltzer reports: In the course of working with peas it was found that the peas were below 25-32 F for half of the drying cycle, but rose to above 32 F for

†See "Freeze-Drying of Food Products" by J. C. Harper and A. L. Tappel, Advances in Food Research Volume 7, 1957, Academic Press.



the final half. This indicated that drying to completion above the freezing point was not harmful to the quality characteristics of the final product.‡

The transition of frozen to unfrozen condition was found to be at an average moisture content of 71%, which corresponded to the removal of about 46% of the original total moisture.

Peas freeze dried below 71% moisture could be air dried to yield a porous dried product of spherical shape and good rehydration characteristics. Peas that were totally air dried or even vacuum dried were quite inferior in appearance and reconstitution.

At the time of this work (1948) a comparison of costs — fixed charges, labor, and utilities — showed virtually identical costs for partial freeze drying vs. freeze drying alone to completion. The cost of a smaller freeze dryer was offset by the cost of the air dryer plus the additional labor for transfers and shift differentials for night work.

A similar economic comparison was made in 1954 for chicken meat. Although the initial equipment investment could be reduced by about 20%, the final cost of the combination-dried product was only marginally lower than that for totally freeze dried.

Quality of the combination-dried product was non-uniform and much of the advantages of appearance (light color) and tenderness was impaired by finishing with air drying. (Surprisingly, such secondary drying did not cause a conspicuous increase in Peroxide Value, a measure of fat rancidity, even though air drying alone can be very hazardous to fat stability.)

In this economic comparison, freeze drying was estimated to cost 1.3 times vacuum drying alone, and 2.5 times air drying alone. The latter methods produced inferior products.

Shelf life with unimpaired quality at room temperature for a year or more requires that moisture content in product freeze dried be not more than about 2%.

If a shelf life of 2 or 3 months would be satisfactory, higher moisture content could be tolerated, and the drying time could be shortened considerably. Thus, based on the data in the drying curve above, increasing the final moisture from 2% to 5% decreases the time required for drying from 13 hours to less than 5 hours. END

‡Discussion which follows up to "Shelf life" is taken from paper which Seltzer presented at the recent QM Symposium on Freeze Drying — see first footnote, page 29.

DOW | announcing VERSENE CA

CONTROL SPOILAGE LOSSES WITH NEW DOW CHELATING AGENT

A NEW APPROACH to problems caused by trace metal ions in food is now available. Versene® CA chelating agent is calcium disodium EDTA (calcium disodium ethylenediaminetetraacetate dihydrate)—a product developed specifically for the food industry. It chemically inactivates troublesome metal ions such as iron, copper and nickel. Such ions, unless controlled, can cause formation of undesirable precipitates and complexes and catalyze oxidative degradation.

UNWANTED PRECIPITATES AND COMPLEXES are widely encountered in food products. Insoluble, needle-like struvite crystals frequently form in canned seafood, decreasing customer acceptance. Complexes of heavy metals appear to be a cause of "gushing" or "wildness" in beer and cloudiness and sedimentation in wine. Versene CA chelating agent solves both these problems. In addition, it may be utilized to eliminate the undesirable blackening caused in cauliflower, asparagus, and potatoes by iron complexes.

RETARDATION OF OXIDATION with Versene CA is an excellent method for stabilizing flavors and odors and thus extending the shelf life of food products based on fats and oils. Inactivation of metal ions not only eliminates the catalytic effect of the ions on the oxidative process, but also enhances the effect of anti-oxidants such as ascorbic acid. Versene CA has been shown to eliminate the white ring which commonly forms on the surface of French dressing during storage. Retardation of oxidation extends the shelf life of mayonnaise, salad dressing, margarine, nutmeats, and similar products.

FDA REGULATIONS on the use of Versene CA in sandwich spreads, malt beverages, and in non-standardized sauces and dressings were published in the August 4, 1960 issue of the FEDERAL REGISTER. Further regulations under the Federal Food, Drug and Cosmetic Act are expected to permit the use of Versene CA in other food products.

FOR FURTHER INFORMATION and samples write Technical Service and Development, THE DOW CHEMICAL COMPANY, Midland, Michigan, Department 605BH11.

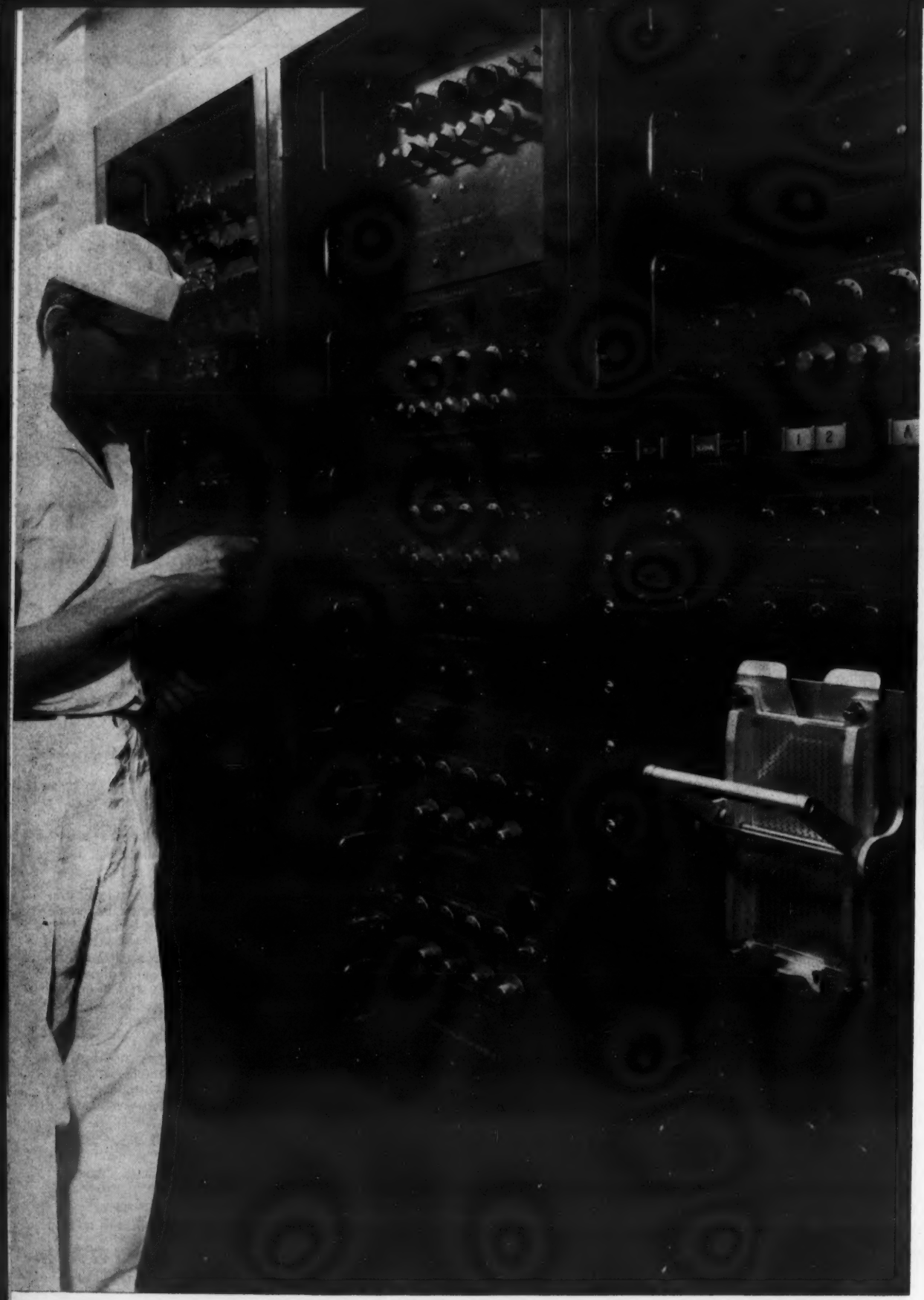
See "The Dow Hour of Great Mysteries" on NBC-TV.

THE DOW CHEMICAL COMPANY · MIDLAND, MICHIGAN

6778 on Reader Service Slip.

Automation at Hood Dairy — IV

The first three articles in this series on Automation at Hood Dairy, Boston, Mass., appeared in September, 1960, FOOD PROCESSING. They described: (I) the general objectives, operation, and cost of automatic ice cream mixing; (II) the turbine flow meter — key to accurate batch measuring; and (III) the use of the electronic computer to optimize ingredients in a formula. Next month's article (V) will describe the automatic CIP method designed for this system which features independently adjustable steps in its operation



AT LEFT, operator is shown at automatic flow-control console, manually controlling sequence of ingredients to be mixed. Next, he will manually preset quantities of each ingredient by turning dials. In automatic operation, these controls are not used by the operator, and the formula for the mix, coded on a punched card, is inserted into card reader at extreme right of the console.

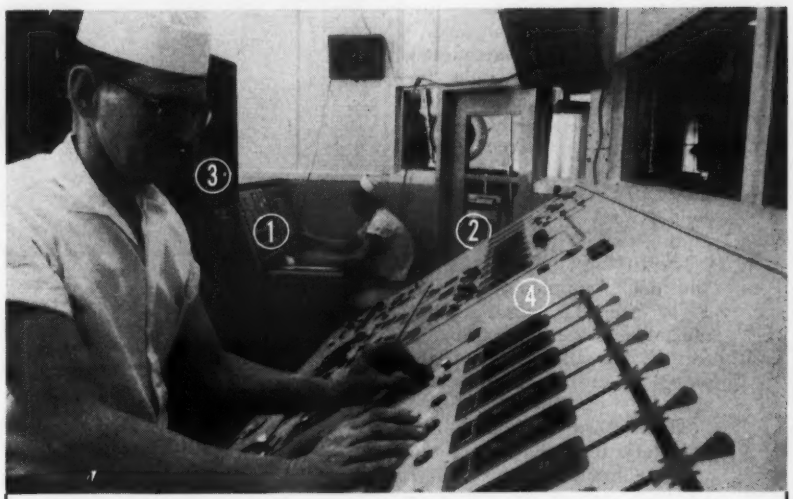
ABOVE, close-up photo of operator inserting formula into card reader on automatic flow-control console by means of a coded punched card. All of the console except that part immediately around this punched card reader is covered with removable panel doors.

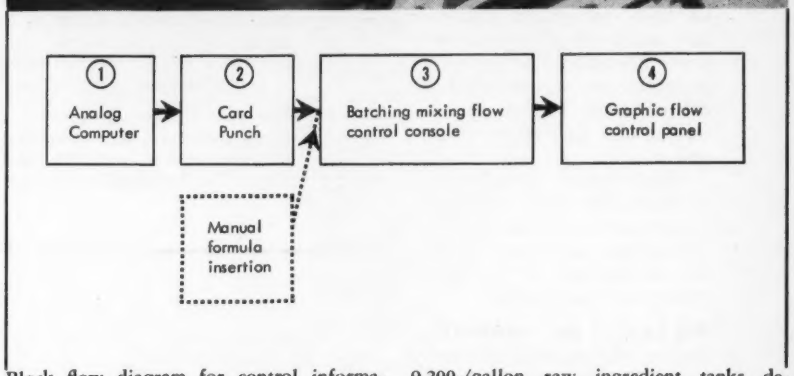
Centralized automatic flow control for batch mixing of liquid ingredients

- **adapted to coded punched formula cards at Hood**
- **can be operated with manual insertion of formula**

HOWARD P. MILLEVILLE

Editor





Block flow diagram for control information. Numbers in blocks correspond to instruments numbered in photo above. Automatic card punch (2) is directly behind the graphic panel (4) and is not visible.

From this graphic flow panel board, operator remotely controls valves which direct flow of raw materials and pasteurized mix, exercises manual control over pumping operation whenever necessary, and also controls the CIP operation.

Operator at this graphic flow panel is directing flow of pasteurized mix into one of eight mix storage tanks which are graphically shown on the upper right of the panel. Each of these tanks has a high and low level indicator; also each of the 9,200-/gallon raw ingredient tanks depicted at the left of the panel has a high and low level indicator.

When either a low or high level is reached, alarm sounds and pump stops; Operator then manually rearranges flow and restarts pump. Counters on this board indicate the quantities of raw materials pumped per batch.

While the mixing is batchwise, the HTST pasteurization is continuous. When on occasion the level of mix in the balance tank ahead of the pasteurizer drops to low level, water is automatically introduced into the system and recirculated back to balance tank. Timing sequence controls minimize loss of mix with water during changeovers.

AS NOTED in the preceding article in this series (September 1960, page 40), the formula for a specific mix as worked out with the aid of an electronic computer is automatically coded on a punched card.

In automatic batching, the punched card is inserted into a reading device of the electronic system. The ingredients are introduced in two steps and the selection of the step for each ingredient is manually performed by the operator before depressing the start switch. The electronic system not only reads the card and causes the correct amount of raw ingredient to be pumped from each raw storage vat, but also automatically directs batching flow of ingredients into one of two 10,000-gal mixing tanks.

It might be noted that for applications where the scale of operations does not justify the use of a computer or a coded punch card system, a manually controlled automatic batch operation could be set up as the standard procedure.

The electronic devices contained in the console shown in the accompanying photo were designed and developed by Potter Aeronautical Corporation of Union, N.J. They were incorporated into an overall automatic batching system application engineered by Nils G. Jonsson of Hood's Engineering Department in conjunction with Brown Instruments Division of Minneapolis-Honeywell Regulator Company as depicted in the block diagram for control information at right.

In the system at Hood, provision is made to batch nine ingredients — six at any one time — and for the later addition of other ingredients. Each batch-mixing operation is done in two steps. Ingredients to be added in each step are manually programmed in advance by operator; they are pumped simultaneously to the mix tank during each step.

The console controls the flow of ice cream mix ingredients from holding to blending tanks, producing identical end products from the same card every time. It also "worries" about the precise amounts required of each ingredient and will halt the blending process if there is an insufficient amount of an ingredient available or if any other irregularity occurs.

In such cases, a supplementary card can be introduced simulating the raw ingredient in the vat just emptied. After correcting the condition, the

Centralized automatic flow control for batch mixing of liquid ingredients continued

console then demands the return of the original card.

After blending is completed, the system allows time for draining of pipes and headers into the process tanks. At the end of this operation, the console records the batch as complete and automatically switches to the second of two mixing tanks.

Identifying lights, such as "normal," "supplement," "step 1" or "step 2," "mixing tank" etc., keep the operator informed at all times of the status of the blending operation.

The Pottermeter console also remotely displays on the graphic flow panel the amount of each ingredient delivered per batch. It also simultaneously maintains for accounting purposes an accumulated total of each ingredient used during any desired accounting period.

After normal completion of a batch, the start button can be pressed to deliver an identical batch, or a new card can be introduced to deliver a variation of a formula.

Pulses do controlling. Hence, the control system is adaptable to any production operation where it is desired to control a numerical or digital quantity, and this quantity can be measured and transduced into electrical pulses.

In this particular application for controlling the flow of liquid ingredients, the pulses are generated by the rotation of a permanent magnet embedded in a sanitary, turbine-type, flowmeter described in Part II of this series (September 1960).

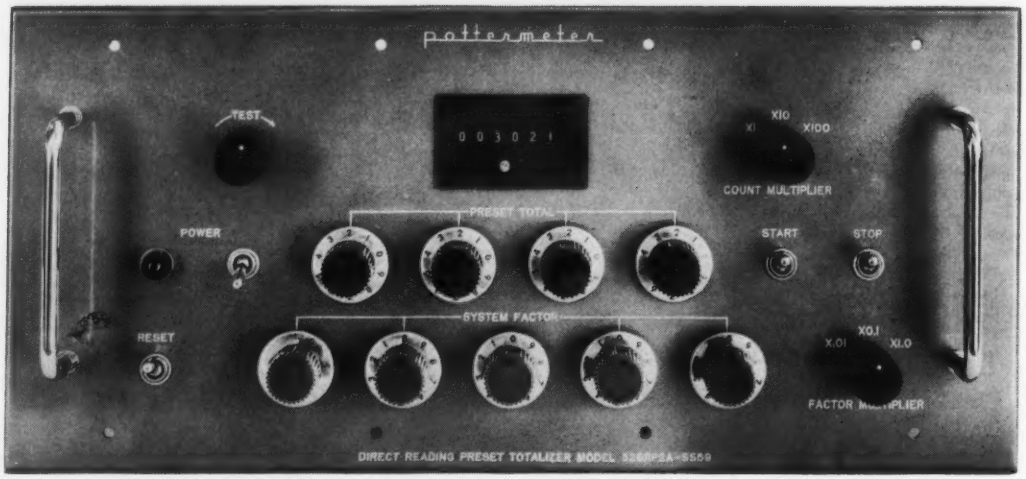
For each flowmeter, there is a standard control component. One of these components is shown in the photo above.

Translation of pulses into quantities measured (pounds, gallons, etc.) is done by adjusting the system factor — the bottom row of dials. The total quantity desired per batch is preset on the memory circuit by means of the upper row of dials in manual operation or is transferred to the controller automatically from punched cards by means of the card reader.

The pound output of each ingredient is individually totalized in the control center. On reaching the preset total, a relay is released and deactivates the valves and pump associated with its ingredient.

The Pottermeter system uses modular control components as building blocks. There are 234 transistorized sub-assembly printed circuits, plug-in boards in the entire system, but less than 10 different kinds need be stocked for maintenance.

6779 on Reader Service Slip.



Controller for each ingredient is contained in a standard modular-constructed unit. Nine of these units are integrated into the console shown in the other photos.

In each unit is a scaler, or digital computer, which converts various pulses per gallon constants from any Pottermeter (turbine-type flow meter) into single counts per pound increment. The scaler is 100% digital in function and can apply a computation factor (bottom row of dials and factor switch) between 0.000001 and 1.9999 to a resolution as great as 0.005%.

The pulses now representing pounds are fed into a counting section consisting of four binary-decimal circuits, each representing a decimal digit. The four-digit, counting circuit is compared by the coincidence circuit to a four-digit memory circuit set by the punched card (or preset by the upper row of dials in manual operation) by means of a coincidence circuit. This coincidence circuit is capable of detecting one preset number of a possible 10,000.

Thus, counting the number of preset combinations possible and the number of flow counts possible, the coincidence circuit can resolve one number out of a possible 100 million combinations.

When the flow count total equals the preset total, the coincidence circuit opens a duty relay which, in turn, closes a valve to stop the flow of the particular ingredient being monitored, and to stop the unloading pump.

NEXT MONTH . . .

Part V, the final article in the series on Automation at Hood Dairy, will appear in the December issue of FOOD PROCESSING. This article will describe the automatic CIP method designed for this system, which features independently adjustable steps in its operation.

For more information on ad at right circle 6780 opposite last page.

What can lemon juice do for mayonnaise?

Exchange Lemon Juice, blended with vinegar, produces higher active acidity in the water phase (and lower in the oil phase) without excessive acid odor. It extends shelf life by improving emulsion stability and reducing tendency to go rancid. Constituents in lemon juice will tie-up metallic ions (such as copper and iron) which attack fatty oils of the emulsion. Of course, lemon juice improves flavor and adds a saleable distinction to your label.

For fruit juices?

Lemon juice produces a pleasing, well-balanced tart flavor and blends well with all fruit juices. Besides being a flavor-enhancer, it is nature's finest anti-oxidant, doing the job where other chemical anti-oxidants fail. The natural acids (citric and ascorbic) combine synergistically with other natural reductants in lemon juice to increase their anti-oxidant properties.

For your product?

Send us the coupon today—and let our researchers tell you what lemon juice can do for you.

Sunkist Growers

Products Sales Dept., 720 E. Sunkist St., Ontario, Calif.

GENTLEMEN: *Our product is* _____

_____ *How can lemon juice help?*

NAME _____

ADDRESS _____

CITY _____ ZONE _____

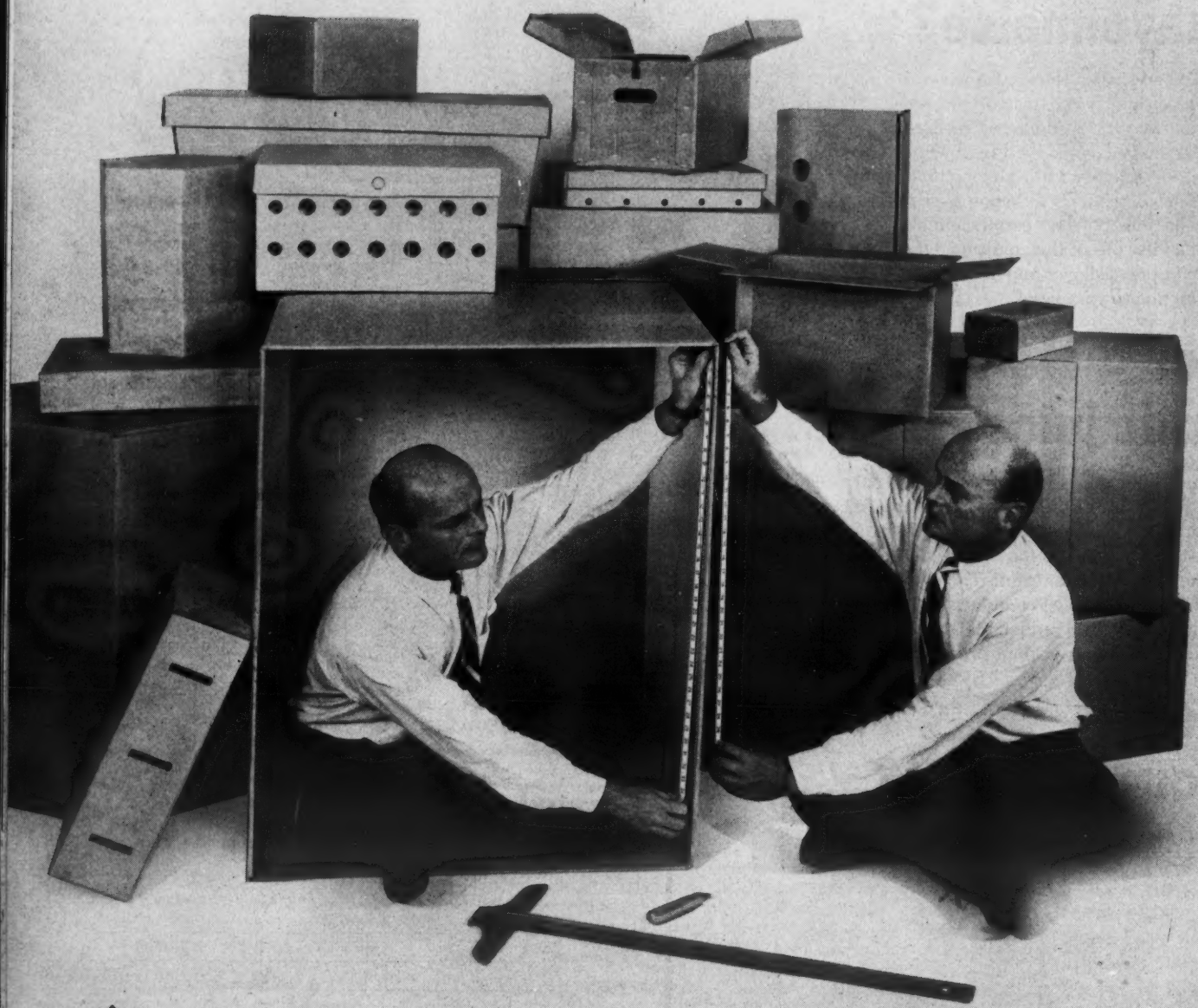
STATE _____

Exchange

GAYLORD SOLVES
PACKAGING PROBLEMS INSIDE AND OUT

Your Gaylord Man isn't twins, he just works like it. He knows the "inside" of container manufacture and the "outside" of packaging operations, so he can give you double-duty service.

Got a packaging problem or two? Call the man who solves them by the pair—your nearby Gaylord Man. Today.



CROWN ZELLERBACH CORPORATION
GAYLORD CONTAINER DIVISION

Gaylord Boxes

IN CANADA • CROWN ZELLERBACH CANADA. LTD. VANCOUVER. B. C.

HEADQUARTERS. ST. LOUIS
PLANTS COAST TO COAST

For more information on product at left, circle 6781 see information request blank opposite last page.

How one major packager meets the Additives Amendment

It's the law . . . we comply with it! Regardless of personal opinion, that's the only way to take the Food Additives Amendment. And that's the basis for Kroger's Processed Foods Division's approach to compliance*

ROBERT N. JOHNSON
Chief Chemist
Processed Foods Division, The Kroger Co.

THE Food Additives Amendment of 1958 has probably had more impact on the food industry than any other single event. Since its passage there has been a tremendous amount of controversy, confusion, and wasted effort. I feel that the Food Additives Amendment is a good law. Regardless of any personal opinion, the fact is that it is the law and, of course, we comply with it.

The food packager's problems relating to compliance with the Amendment are primarily in three areas:

1. Continuing Guaranties.
2. Ingredients.
3. Packaging Material, this third point being the most provocative, complex, and requiring the most new study.

The larger packaging companies have established special staffs and have laboratory facilities to program their compliance. Smaller companies and highly diversified companies must depend on literature, professional groups such as the Packaging Institute, trade associations, and packaging material suppliers to augment their programs. The bulk of the effort to obtain compliance has been by the manufacturers of packaging materials — cans, films, papers, etc. — and have for the most part done it very well. Each packaging company has its own unique problems and approach. I will speak of the approach which our company uses and hope that it is representative; that it forms a framework which you may be able to apply to your own problems.

Regarding Continuing Guaranties, our company early established the policy that it will require these from all suppliers. It was agreed that these could best be obtained by our personnel most able to procure such a guaranty — Procurement. Early in the program it became quite evident that four decentralized procurement groups were not efficient nor totally effective; many suppliers furnished materials to more than one department. It was therefore agreed to handle Continuing Guaranties, with the exception of the initial request, by one central control.

Our first step was to make a master list of suppliers from the individual department supplier lists. In the master list, duplication of suppliers and clarification of companies and subsidiaries was established.

Continuing Guaranties from suppliers of ingredients or finished product was relatively easy. Continuing Guaranties from packaging material suppliers was much different, brought about by:

1. Complexity of packaging materials (they had never before been considered a food).
2. Lack of clearance for many of the materials.
3. Mr. William W. Goodrich's statement of November 1959 regarding the value of Continuing Guaranties as to packaging materials. (Mr. Goodrich is Assistant General Council for Food and Drugs in the U. S. Dept. of Health, Education, and Welfare.) An excerpt from that statement follows:

"Very briefly, the Federal Food, Drug, and Cosmetic Act provides that no person shall be subject to its criminal penalties for shipping adulterated or misbranded food interstate if, in good faith, he holds a written guaranty from another person to the effect that the food guarantied is neither adulterated nor misbranded.

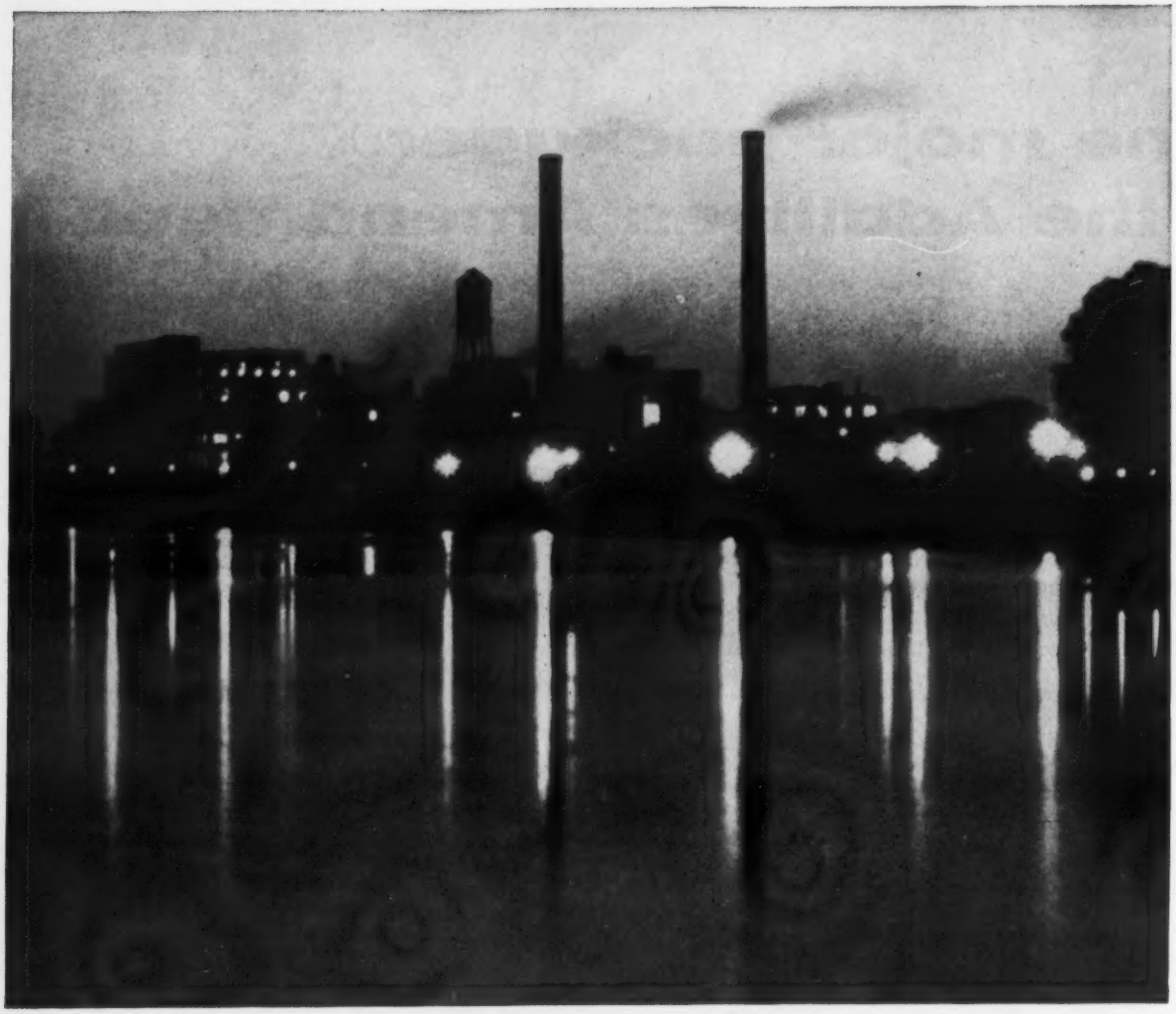
"Under the clear terms of the law, then, the substance guarantied must first be a food, and the guaranty is to the effect that **that** food — not some other food to be prepared from it — is neither 'adulterated' nor 'misbranded,' as those terms have been defined by the Congressional glossary.

"Food additives were not themselves specifically classified as 'food' by the amendment. The House Committee explained that such classification would be surplusage. They are food only to the extent that their intended use may result in their becoming components or otherwise affecting the characteristics of food. The legislative record specifically states that ordinary packaging materials used to preserve shape, prevent moisture loss, to prevent contamination with dirt, and to provide convenience in use, handling, and storage are neither foods nor food additives. Nonetheless, the record also shows that packaging materials composed of substances which migrate to the food may be subject to the safety provisions of the law. . .

"This container could be guarantied, and any person who distributed it interstate in reliance upon a valid guaranty would be protected from criminal prosecution — though not from seizure or injunction. But a guaranty relating to a packaging material which is neither a food nor a food additive would be a meaningless document."

Our present position at Kroger is this: We still seek Continuing Guaranties. In the absence of a blanket guaranty we request information regarding the status of the various clearance programs. At the moment, we feel that the latter approach is preferable to hav-

* Paper presented this month at the annual Packaging Institute Forum (Nov. 2), New York City.



24 HOURS A DAY

A Better Processed Food for you with Clinton Products from corn

corn syrups • corn starches
Dextrose • Refined corn oil
Lactic Acid

See your Clinton salesman today.

CLINTON TECHNICAL SERVICE is freely available upon request.

CLINTON

CLINTON CORN PROCESSING COMPANY, CLINTON, IOWA

6782 on Reader Service Slip.

ing the blanket guaranty. It was, of course, necessary to program the determination of the status of the packaging materials we use. The first move was to make a list using our IBM cards of every packaging material received into the plants. This list was then reviewed and materials put in the following categories:

Glass
Tin
Shippers
Closures
Coatings & Inks
Boxes
Films and Foil
Paper
Adhesives
Waxes

Each of these categories then became a program in itself to determine on a periodic basis its status; is it GRAS, cleared with prior sanction, white listed, etc. A number of the materials, for example glass and aluminum, were immediately cleared, and we pointed our efforts toward the more difficult and complex materials such as films and papers.

It was necessary to develop sources of information both generally and specifically on these materials. these are primarily:

1. Federal Register
2. Trade Journals
3. Trade Associations
4. Packaging Institute
5. Supplier Contacts
6. Industry Contacts

We have scheduled routine audits of all categories to determine their status and further to attempt to anticipate areas needing additional effort and even plan for possible substitution or replacement. Some changes have already been made. For example, we have replaced the amber-colored, grease-proof coffee bag liner with a colorless (buff) liner.

There also occurs at the present time — infrequently, but bound to increase — decisions regarding the use and procurement of packaging materials for products which will not be marketed until after March 5 of next year (date when all present time extensions on additives involved in packaging materials expire).

The decision in each instance is made based on our interpretation of information received through the Packaging Institute, with suppliers, other industry contacts, and trade associations. END

Annual Meeting of FDA and FLI on November 28-29

The annual meeting of the Food and Drug Administration and the Food Law Institute will be held at the Health, Education and Welfare Auditorium in Washington, D. C. on November 28 and 29.

Highlight of the two-day meeting will be the presentation of an award "for distinguished food law services to the American people" by the FLI to the Food Protection Committee of the Food and Nutrition Board, National Academy of Sciences, National Research Council. (See page 25.

While details of the meeting had not been finalized at the time FOOD PROCESSING went to press, advance notice indicated the following program:

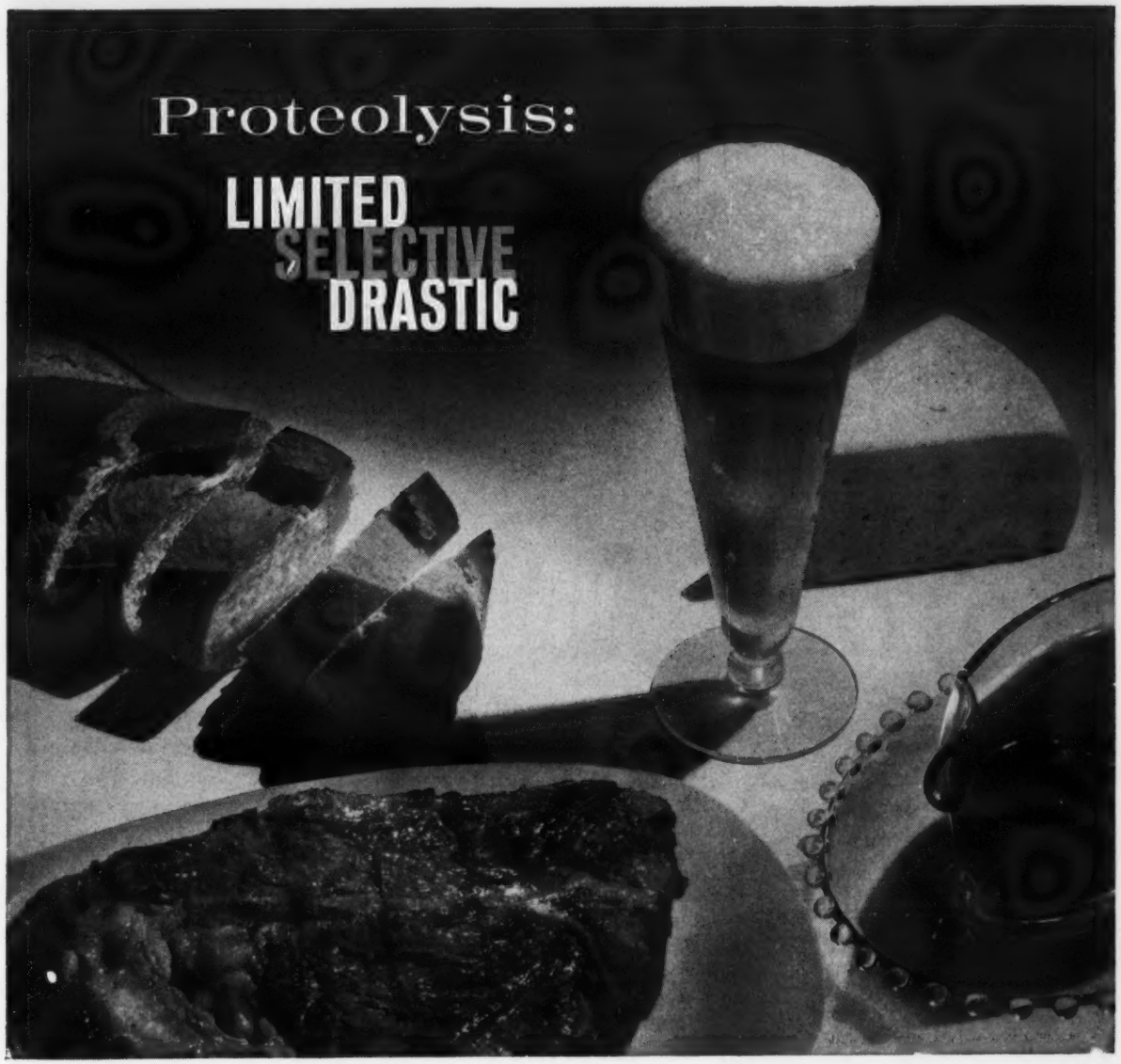
The morning session on November 28 will be conducted by FDA with speakers from FDA discussing food additives, FD&C colors and hazardous substances labeling. New laws will be emphasized.

At the afternoon session, there will be an industry panel discussion. Representatives of large food and drug companies (manufacturers and probably distributors as well) will make up the panel, with Dr. Bernard Oser moderating.

The morning session on November 29 will offer a consumer panel discussion. Moderator for this panel will be Dr. Charles Glen King, President, Nutrition Foundation.

The afternoon session on this same date will be a question and answer period under the direction of Franklin M. Depew, President, FLI.

All interested parties are invited to attend the meeting.



TAKAMINE Proteases for any degree of proteolysis in baked goods, beer, meats, fish, cereals, chocolate and protein hydrolysates. Miles offers you the most complete line of proteases available. Specific proteases to meet your specific needs. Proteases that help increase product quality, that help reduce processing costs. Write for complete information on the wide variety of protease enzymes from Takamine. All inquiries handled promptly. TAKAMINE® (*pronounce it) Tack-a-ME nee)

Miles Chemical Company
DIVISION OF MILES LABORATORIES, INC.,
ELKHART, INDIANA

General Sales Offices: Elkhart, Ind., Telephone COngress 4-3111; Clifton, N.J., Telephone PRescott 9-4776; New York, N.Y., Telephone MUrray Hill 2-7970

It will TASTE better, LOOK better, SELL better with Takamine products

6783 on Reader Service Slip.

Staley Quality Improvement Pointers:

in flavor, body, color, profits...

Sweetose makes the difference! Here's why!

In combination fruit juice drinks, Sweetose blends and enhances the natural flavors and colors of fruits.

In canned fruit sauces, Sweetose holds appetizing natural color. Enhances that just-picked flavor with balanced sweetness.

Sweetose, the original enzyme-converted corn syrup, brings out true fruit flavor . . . gives a brighter, richer, more appetizing appearance that wins sales!

Whether you pack jams and jellies, fruit juice drinks, or fruits and berries, remember this: bland, crystal-clear Sweetose Corn Syrup gives balanced sweetness control—never masks a flavor no matter how delicate.

Strawberries taste like real strawberries, grapes like real grapes, peaches like real peaches, for Sweetose holds natural "fresh-picked" flavor! Captures true fruit colors at their peak. Improves appearance, body and texture in a wide variety of fruit products.

Look into the many advantages of Sweetose today. For more information on how Sweetose can impart customer-winning characteristics to your products at *definitely lower sweetener costs*, see your Staley Representative at the branch office nearest you, or write:

A. E. STALEY MFG. CO., DECATUR, ILLINOIS

Branch Offices: Atlanta • Boston • Chicago • Cleveland
Kansas City • New York • Philadelphia • San Francisco • St. Louis

Sweetose®

THE ORIGINAL ENZYME-CONVERTED CORN SYRUP

6784 on Reader Service Slip.

Describes corn from farm to finished foods

Corn in Industry, a 64-page booklet published by the Corn Industries Research Foundation, Inc., describes how corn kernels are taken apart to make starch, syrup, sugar, oil and feeds and how these products enter into the manufacturing processes of scores of food.

Fully illustrated with drawings, diagrams, prints and photos, the booklet traces corn's contribution to American agriculture from farm to finished products.

The development of corn from a wild grass to the specialized hybrids of today is discussed. The booklet concludes with a look at the future and potential new uses for corn.

6785 on Reader Service Slip.

Compiles information on nearly 3000 detergents and emulsifiers

The fifth edition of "Detergents and Emulsifiers . . . up to date 1960" contains almost 3000 trade named products listed alphabetically and manufactured by over 250 companies in the United States.

Information given includes company name, class and formula of the product, main uses, form, per cent active concentration, type and other comments regarding specific uses and specification or nomenclature of the products.

All company names appearing in the book are indexed in an appendix with page numbers listed after each name to indicate where the products of each company may be found.

Publisher: John W. McCutcheon, Inc., 475 Fifth Ave., New York 17, N. Y., Price — $3.50. Quantity prices are available on request.

For more information on product at right, circle 6786 . . . see information request blank opposite last page.

OTHER OLIN PACKAGING PRODUCTS: CONTAINERS, BAGS, CELLOPHANE, POLYETHELENE, FINE PAPER
Write for illustrated Brochure "The Olin Carton Service"

It takes more than paperboard to make

OLIN CARTONS

package design
• printing skills
• modern equipment • resources
• basic research • quality control
• dedication . . .

OLIN MATHIESON
Packaging Division
P. O. Box 488, West Monroe, Louisiana

STARCHES and SYRUPS

Keep your product in her cart ...week after week

Corn starches and syrups are time-tested, nourishing, economical carbohydrates. They've long been used and accepted as foods and food ingredients. They may be the answer to problems you have resulting from recent legislation regarding foods because:

In addition to being time-tested, nourishing, economical carbohydrates, corn starches and syrups can provide valuable functional properties as:

• Stabilizers • Emulsifiers • Binders • Humectants • Bland sweeteners • Texturizers • Preservatives (of natural body and color) • Thickeners (for consistency control) • Sugar Crystalization control • Coatings—Glazes

CORN STARCH is ideal for baking, baking powder, meats, mustard, salad dressing, custards, pudding, canned soups, etc.

CORN SYRUPS are used in mixed syrups, infant foods, preserves, jams, jellies, baked beans, sausage and cured meats, frozen and canned fruits, frozen deserts and many other products.

CORN SYRUP SOLIDS are widely used in ice cream, baked goods, frozen fruits, dry food mixes, jams, jellies, table ready and canned meats, to mention just a few.

Whatever you may be processing OK BRAND corn syrups or starches will help you keep your product in her cart week after week.

Call the Man from Hubinger ...his service is freely available. Write, wire or phone today.

THE HUBINGER COMPANY
Keokuk, Iowa

NEW YORK • CHICAGO • LOS ANGELES • BOSTON • CHARLOTTE • PHILADELPHIA

You can depend on HUBINGER... *fast shipment by rail... prompt delivery by truck*

6787 on Reader Service Slip.

Highly Intimate Blends in 1 to 2 Minutes

Blends while discharging; No segregation or flotation

Sturtevant Rotary Blenders start 4-way blending while charging, continue it during discharge, thus producing highly intimate, even blends of dry and semi-dry materials – within 3 to 5 minutes of start of charging.

Six *complete* blending cycles per hour are common. And Sturtevant's special action produces no particle reduction, cleavage or attritional heat – is highly effective yet gentle and safe even with explosives.

Receiving

Scoops cascade material as drum rotates. Movement forces material from both ends to middle. Thus blending is 4-way right from start of charging.

Discharging

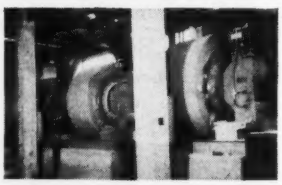
Single gate controls charge, discharge. Blending continues throughout discharge phase. Result is no segregation or flotation — highly intimate, even blends.

Self-cleaning, dust-sealed drum; one-man accessibility

Operation of Sturtevant Blenders is self-cleaning – drum interiors are completely dust-sealed. For inspection of all models, one man simply loosens a few lugs to remove manhole cover – quickly and easily.

Nine standard models with capacities to 900 cu. ft.

10 cu. ft. Sturtevant Blender at U.S. Steel Corp.'s new Applied Research Laboratory (Raw Materials Division) in Monroeville, Pa. This unit handles batches up to 500 lbs. — is ideal for pilot work and small runs.



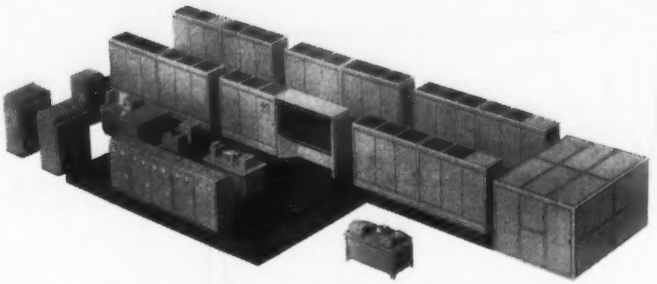
Automatically controlled, three 50 cu. ft. Sturtevants blend chocolate powder and other ingredients for Hershey Chocolate Corp. Operating in a group, each Blender can process more than a ton per batch. Quick accessibility and self-cleaning features keep maintenance to one hour per week.

Fully or semi-automatic, or manually controlled operation

Constructed of carbon steel, stainless steel or Monel metal, Sturtevant Rotary Blenders are engineered to fit each customer's needs – can be supplied with injector sprays and any desired control system.

For more on Sturtevant Blenders, request Bulletin No. 080B. (Bulletins also available on Mixers, Air Separators, Micronizers, Crushers and Grinders.) Write today. STURTEVANT MILL CO., 122 Clayton St., Boston, Mass.

6788 on Reader Service Slip.



Although basic mathematics of sausage formulation is relatively simple, it is practically impossible manually because of complexity. Univac Scientific 1103 computor shown here is similar to unit in use at SMU Center; works at extremely high speeds

Available on fee basis to all sausage processors . . .

Electronic computor for least-cost highest-quality sausage formula

FRANK L. BONEM
Associate Editor

A NEW COMPUTOR method enables all packers and sausage manufacturers — whether large or small, with many different blends or just a few — to avail themselves of an economical program for solving sausage formulation problems.

Method for computing blends was developed at Univac Scientific Computer Center, located on the campus of Southern Methodist University, Dallas, Texas.

Offered by Remington Rand, 314 Park Avenue South, New York 10, N.Y., program is available to all sausage processors in this country, regardless of geographical location, making use of telephone, wire, or mail.

Cost of program to processor is minimal. As a result of high processing speeds, data preparation costs can be as low as $5 per calculation of blend.

Basic procedure of operation is as follows: Complete information describing requirements of all of the customer's blends is recorded on a special magnetic tape reserved for his use.

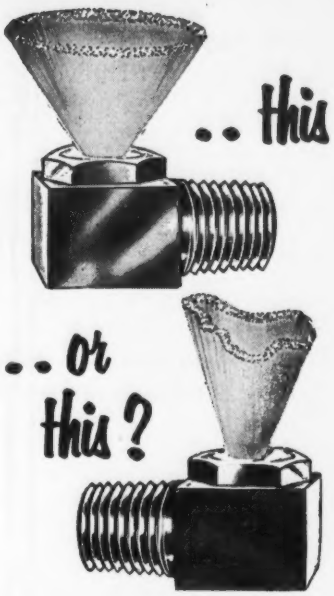
This information includes a nutrient analysis of available ingredients (percentages of proteins, fats, etc.), minimum and maximum nutrient requirements of the resulting blend, and permissible minimum and maximum amounts of individual ingredients.

Magnetic tape is then filed for use as needed.

Periodically, when ingredient prices change, customer relays new prices to service center in Dallas, Texas.

As soon as new prices are received at center, the magnetic tape on file is mounted on computer and the prices are fed into its "memory" unit. From this point on, the program automatically computes the new least-cost formula for each desired blend in the following manner:

1. The requirements for one blend are read from the magnetic tape.
2. Prices of ingredients specified as available are selected from the computer's "memory."
3. The new least-cost formula is computed by means of linear programming.
4. An output of the least-cost



BE SURE OF A PERFECT CONICAL SHAPE SPRAY ALL THE TIME WITH *Monarch*

For a perfect spray, many food processing plants prefer Monarch nozzles.

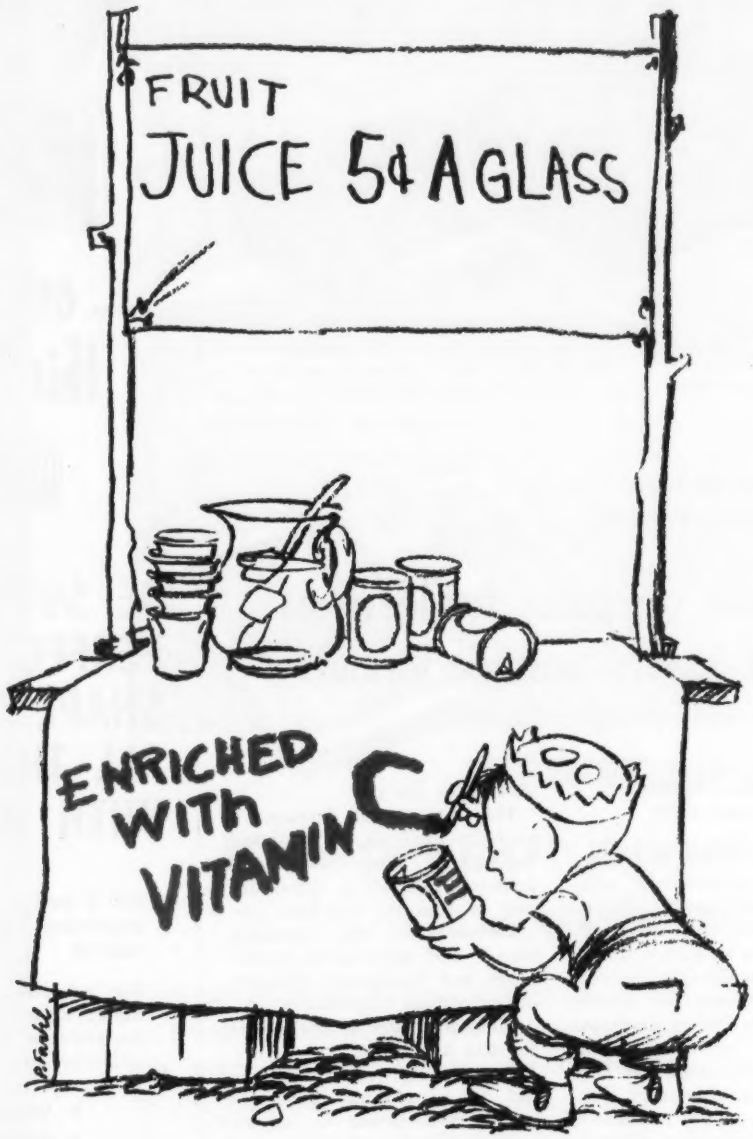
This advanced design nozzle reduces clogging and guarantees dependable food processing applications to . . .

- **WAX FRUITS**
- **RINSE VEGETABLES**
- **POWDER MILK**
- **DRY EGGS**
- **WASH FILTER CAKE**
- **HUMIDIFY BANANA ROOMS**

Send for Catalog 1

Monarch
MFG. WORKS, INC.
3401 GAUL STREET
PHILADELPHIA 34, PA.

6789 on Reader Service Slip.



(give your customers more for their money)

IT often takes an *extra* dividend to make a product a best-seller. In the case of fruit juice blends, vitamin C enrichment provides precisely this valuable competitive advantage.

A blend that's fortified with vitamin C gives today's alert shoppers more value for their money, more nourishment for their families. *And it costs just a fraction of a cent per unit to add PFIZER VITAMIN C to your product.*

As an extra bonus, vitamin C helps retard color fading and flavor loss during shelf life.

Pfizer, a leading manufacturer of vitamins, makes vitamin C (ascorbic acid) in convenient, easy-to-handle forms. Other Pfizer products – citric acid and sodium citrate – insure the true fruit tanginess of canned fruit juice blends.

Win new attention for your product with vitamin C. Contact Pfizer for complete details.

Science for the World's Well-being Pfizer

CHAS. PFIZER & CO., INC., CHEMICAL SALES DIV., 630 FLUSHING AVENUE, BROOKLYN 6, NEW YORK
Branch Offices: Clifton, N. J.; Chicago, Ill.; San Francisco, Calif.; Vernon, Calif.; Atlanta, Ga.; Dallas, Texas; Montreal, Canada

formula is produced for printing.

5. Process is repeated for other blends.

System is completely automatic from input of current price changes to output of final blend requirements. However, customer control is reserved. Periodic specifications can be supplied to program along with prices.

Controls are of two types:

1. Formula Selection Control — Although all of customer's formula blends are recorded on magnetic tape, this selection option permits him to select only those for solution which are needed for current time period.

2. Ingredient Inventory Control — This option permits customer to restrict individual ingredients from appearing in formula for any specified blend for current time period.

Formula blending cost will vary, depending upon each customer's individual requirements. For example, total processing cost per product for 25 ingredients and 17 blend requirements would be $5.23.

Formula blending costs are based upon Univac Service Center rates, which are as follows:

Univac Scientific 1103 ..... $150.00 per hr
Programmer-analyst ..... $15.00 per hr
Data Preparation ..... $4.50 per hr

6790 on Reader Service Slip.

"Well, I don't know — I've always felt I was cut out for research."

Processing innovation opens way to new uses for cranberries

JOE VOORHEES
Associate Editor

Canned, whole, cooked cranberries are now available for use in bakery foods, candies, ice cream, gelatin desserts, frozen food dinners, etc.

HERETOFORE, processed cranberries have been limited in use because applying heat to them, the usual method for preserving the fruit, caused the skin to rupture, producing a final product of jam-like consistency, rather than a whole fruit.

Under a new processing innovation, however, whereby the berry is first pierced and then cooked in a vacuum pan, it is now possible to end up with a canned, whole, cooked fruit, which retains its distinctive flavor and color.

Piercing the cranberry releases air from sacks under the skin of the fruit, which prevents it from bursting when heat is applied during processing.

Processed by Cranberry Products, Inc., Eagle River, Wis., the whole cranberries are being marketed as Cransweets (a whole berry processed in sugar syrup), maraschino cranberries, and spiced cranberries.

New uses

The whole cranberry varieties may be used to produce many new products in bakery foods, candies, ice cream, gelatin desserts, frozen dinners, etc.

Maronn Candies, of Milwaukee, Merrill Candy Co., Dutch Mills Candies and others are already using them in cranberry cordials. They would also have application in the confectionery industry in candy bars, fruit confections, etc.

These whole cranberries are also finding use in the ice cream industry; the Borden Company, also of Milwaukee, is now marketing a Cransweet sherbet.

Bakers can use any one of the varieties of whole cranberries for decorations or in fruit cakes, coffee cakes, muffins, fruit breads, biscuits, cookies, tarts, apple pies and other bakery items. (See photos)

Dry food packers, particularly manufacturers of gelatin desserts, can use the whole cranberries as prepared fruit ingredients.

Frozen food packers could dress up such products as frozen turkey and chicken dinners with whole cranberries, thus making the dinners quality products.

Processing method

The method for producing the whole cranberries was perfected in pilot plant studies by

To next page

Other Cranberry Uses

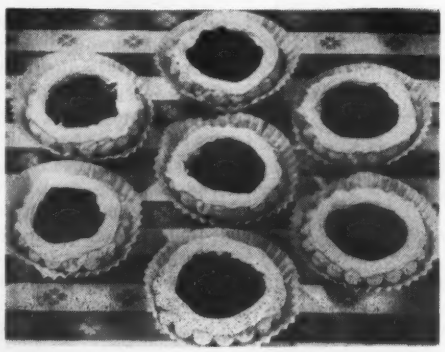
In addition to whole, cooked cranberries, Cranberry Products, Inc. also produces a line of cranberry preserves in combination with other fruits, as well as a cranberry-orange relish and a cranberry chili sauce.

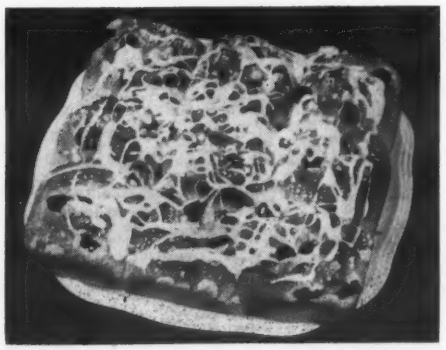
The cranberry preserve-fruit combination, which may have possible uses as fillings for coffee cakes, etc., includes cranberries with pineapple, cherry, gooseberry, raspberry, strawberry and rhubarb.

Cranberry chili sauce may find application in the preparation of barbecued frozen dinners. And cranberry-orange relish could be included as a condiment with frozen turkey and chicken dinners.

Cranberries are also being used for juice, syrup and cranberry vinegar.

Pictured below are three bakery products in which whole cranberries may be used. Left to right are tarts made with whole cranberries, a cranberry-streusel coffee cake where whole cranberries are incorporated into the dough before baking and a cranberry sweet roll using whole cranberries





KELCO COMPANY

technical bulletin

Use unique Kelco Algin Colloids to improve your food products

In Frozen Foods, Kelcoloid, in acid to neutral foods having oil-water systems, provides emulsion stability. Coarse ice crystal formation is retarded. Kelcoloid holds structure of food, maintains smooth uniform texture, and promotes complete flavor release.

In Salad Dressings, Kelcoloid, highly efficient stabilizer, prevents body separation and markedly increases shelf life. Kelcoloid promotes a uniform, smooth consistency giving dressings a highly desirable, palatable appearance.

No Surer Way to Achieve Effective Emulsion Stability

KELCOLOID HVF, the high viscosity member of this series, is generally recommended for use where a decided increase in viscosity is desired along with effective emulsion stability.

KELCOLOID LVF, the low viscosity member of this algin series, produces excellent emulsion stability and desirable body qualities. The LVF is recommended for use where a high degree of emulsion stability is desired with a minimum change in viscosity and body properties.

YOURS ON REQUEST: Free samples of KELCOLOID and other Kelco algin products, plus Technical Data describing properties, advantages and uses. At your service, too, are highly qualified food technicians ready to give individual attention to your problems. Write without obligation to your nearest Kelco regional office.

Kelcoloid HVF® Kelcoloid LVF® products of Kelco Company

75 Terminal Avenue, Clark, N. J. • 20 N. Wacker Drive, Chicago 6, Ill. • 530 W. Sixth Street, Los Angeles 14, Calif.
Cable Address: KELCOALGIN — CLARKNEWJERSEY

6791 on Reader Service Slip.

Professor Kenneth G. Weckel of the Dairy and Food Industries Department at the University of Wisconsin. It is patented by The Wisconsin Alumni Research Foundation.

In actual processing, cranberries are washed, graded and inspected in the usual manner. Larger berries are then placed in a piercing machine, which was developed by H. D. Hume Co., Mendota, Ill.

This machine has a large drum-like disc, which is covered with numerous tiny stainless steel needles. As the fruit passes under this drum, each cranberry is pierced at least eight times. Holes, however, are not visible in the final product.

Pierced berries are then cooked in syrup under a 25 inch vacuum for five minutes. The syrup replaces the air in the small sacks under the skin of the fruit.

Once the berry comes out of the vacuum cooked, it can be reprocessed, without damage, into any one of the whole cranberry products offered by Cranberry Products, Inc.

Whole cranberry products are packed in #10 tins, six to the case; ½-gallon glass jars, six to the case; and gallon jars, four to the case.

Samples may be obtained by writing to Vernon Goldsworthy, Cranberry Products, Inc., Eagle River, Wis.

6792 for whole cranberry products and 6793 for piercing machine on Reader Service Slip.

How citric acid can be used to advantage

A 30-page brochure on citric acid, published by Miles Chemical Company, explores in detail the many ways in which citric acid U.S.P. can be used to advantage. Fully illustrated with photos, drawings and sketches, the brochure introduces the many uses for citric acid.

Included in this is a discussion of its use in the food industry as a flavor-enhancer and for pH adjustment in jellies, beverages, candies and

fondants, package desserts, cheese products, ice cream and sherbets, fats and oils, frozen and canned fruits and fish and in certain vegetable products.

Physical and chemical properties are outlined and grades available are indicated. Brochure then takes up specific applications for individual foods, such as candy, desserts, jellies, jams, preserves, sea foods, beverages and syrups, frozen fruits, and edible fats and oils.

Other food uses for citric acid are then discussed, such as its preferred use for the acidification of foodstuffs, and its sequestrant properties which are particularly useful in areas where oxidation is a problem.

An appendix to the brochure, containing numerous tables and charts, gives much technical information about citric acid and a bibliography lists 78 references on the product.

6794 on Reader Service Slip.

Inactivates trace metals effecting color, clarity and stability in foods

Technical information and use data on Versene CA, a chelating agent developed specifically for the food industry to inactivate trace metals having an adverse effect on color, clarity and stability, is subject of a 20-page bulletin issued by The Dow Chemical Co., Midland, Mich.

Product was recently cleared for use in foods by the FDA under the 1958 Food Additives Amendment.

FDA clearance, covering nonstandardized dressings, sauces, sandwich spreads and malt beverages, permits a 75 ppm tolerance for nonstandardized dressings and sauces; a 100 ppm tolerance for sandwich spreads; and a 25 ppm tolerance for beer.

Two chief advantages, apparent in laboratory and field tests with Versene CA as an additive for certain French dressings, mayonnaise, salad dressings, margarine, sauces and spreads, were extended

Words can't describe the flavor, so let us send you a sample

When you add Tora Food to a food product, something wonderful happens.

We can't really describe it, except to say that Tora Food intensifies and improves the original flavor.

That's why we want to send you a complimentary sample of Tora Food. Then you can try it in your own lab—see for yourself how this superb primary-grown food yeast adds sales appeal to many types of food products.

Incidentally, Tora Food is earning a reputation as a tremendous nutritional booster. Protein content is guaranteed to be better than 50%, and 6.7% of this is lysine. It's a rich source of vitamin B complex, too.

Why not mail the coupon today? Let us send you a complimentary sample of Tora Food. There's absolutely no obligation . . . and you can't lose.

TORA FOOD® by Red Star

Yeast & Products Co.

MILWAUKEE 1, WISCONSIN

RED STAR YEAST & PRODUCTS CO.
DEPT. FP1, MILWAUKEE 1, WISCONSIN

I'd like to find out how Tora Food will improve our products.

☐ Please arrange a session with your technical men.
☐ Please send me a complimentary sample of Tora Food.

NAME_____

TITLE_____

COMPANY_____

ADDRESS_____

CITY_____ STATE_____

6795 on Reader Service Slip.

shelf life and prevention of flavor deterioration.

In the brewing industry, it may be used to prevent "gushing" and improve stability of beer.

Although not approved for use by FDA under the Food Additives Amendment, the chelating agent also has application in other foods.

In the wine industry, it acts as an aid in the clarification and prevention of haze formation during storage. In carbonated beverages, it has shown the ability to control iron and other heavy metal contaminates and maintain the sparkle.

In canned fruits and juices, it has demonstrated ability to maintain high nutritional value in addition to preventing the development of off-flavors and discoloration by eliminating heavy metal ions which are responsible for catalytic degradation problems.

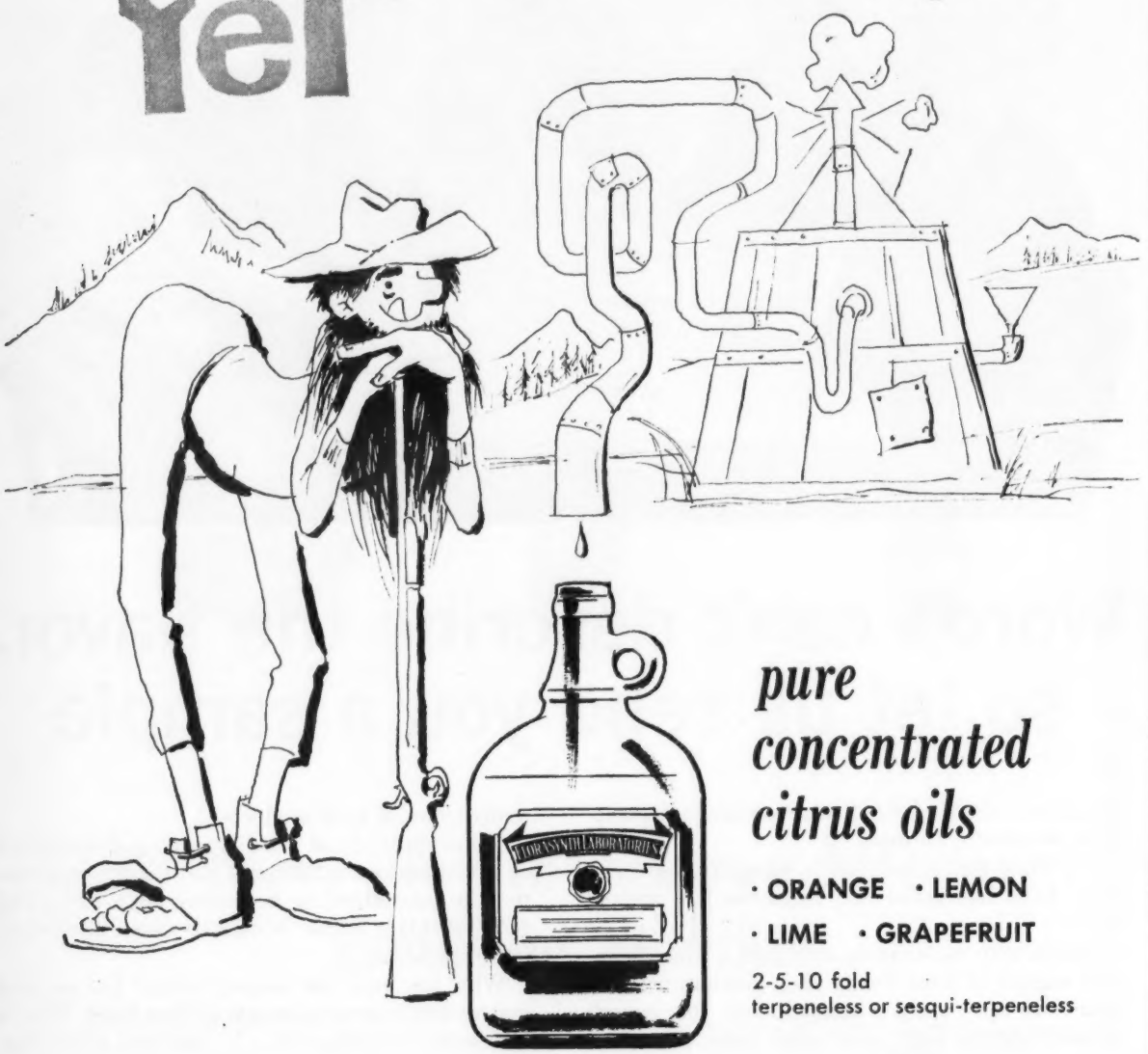
In seafood processing, it shows promise as an aid in preventing struvite formation, preventing discoloration, and prolonging shelf life.

Versene CA (calcium chelate of disodium ethylenediaminetetraacetic acid, high purified), commonly called calcium EDT, is prepared as a white, drum-dried flake material in dihydrate form.

It is available in commercial quantities and in sample quantities for laboratory investigation.

6797 on Reader Service Slip.

YeP nature's flavor all rightee!



pure concentrated citrus oils

· ORANGE · LEMON
· LIME · GRAPEFRUIT

2-5-10 fold
terpeneless or sesqui-terpeneless

- Economical . . . a little goes a lo-o-ong way
- Tops in flavor
- Long shelf life . . . new special equipment removes objectionable low boiling hydrocarbons
- Pioneer producer . . . since 1916
- Blends formulated on special order
- Consult with our flavor specialists

Florasynth
LABORATORIES, INC.

EXECUTIVE OFFICES: 900 VAN NEST AVE. (BOX 12) NEW YORK 62, N.Y.
CHICAGO 6 LOS ANGELES 21
• Atlanta • Boston • Cincinnati • Detroit • Dallas • Minneapolis
• New Orleans • St. Louis • San Francisco
Sales Offices in Principal Foreign Countries

6796 on Reader Service Slip.

"He's not being high-hat, he's just been here longest."

Association News

American Assn. of Candy Technologists

New York Section, is devoting its current series of meetings to seminars on the basic subject of Confectionery Technology Today and Tomorrow. Remaining seminars will include: "Toffees and Caramels and Fudge" (Jan. 12, 1961); "Principles & Practice of Chocolate Enrobing" (Feb. 9); "Jellies and Gums" (March 9); "Nougats and Creams" (Apr. 13).

Wine Institute

San Francisco, announces promotion of its former assistant general manager, Dan C. Turrentine, to manager of the Wine

Advisory Board, also San Francisco. Turrentine succeeds Edmund A. Rossi, retired, in directing sales promotion, advertising, public relations, research and related activities for California's $600 million wine-growing industry.

American Management Assn.

divisional vice presidents elected at recent meetings include two from the food industry: Personnel Division — Albert F. Watters, vice president of General Foods Corp., Manufacturing Division — P. Kenneth Shoemaker, vice president - manufacturing of H. J. Heinz Co. Edwin J. Foltz, president of Campbell's Soup International was elected a director of AMA for a three-yr term.

For more information on product at right, circle 6798 see information request blank opposite last page.

If the proof is in the testing, here's a young fellow who's obviously had a point proven to him. Chances are that Hercules® CMC—Cellulose Gum—has been used in the formulation because Cellulose Gum is becoming increasingly popular as a stabilizer for both pie fillings and meringues.

In lemon pie fillings, such as the delectable one in the picture, Cellulose Gum is providing greater clarity, elimination of cracking and syneresis, and a more pleasing, less short texture.

In meringues, Cellulose Gum is contributing to greater volume, more uniform texture, elimination of syneresis, and because of the better stability—less toughness upon aging.

Similarly, Cellulose Gum is finding application in other bakery specialties such as fruit pie fillings, icings, glazes, doughnuts. Bakery products are only one of the many classes of food formulations which benefit from Cellulose Gum. We'll be glad to discuss the use of Cellulose Gum, which has FDA acceptance in most applications, in your specific formulation. For additional technical data on its use in food processing, write:

HERCULES Cellulose Gum

Virginia Cellulose Department

HERCULES POWDER COMPANY

INCORPORATED

Hercules Tower, 910 Market Street, Wilmington 99, Delaware

VC60-2

From CHR. HANSEN'S
come two *NEW*
Annatto Food
Coloring Products—

"HANSEN'S" A-500
imparts a delicate orange tint to a deep orange-red hue

pure vegetable food colors in an oil soluble base

"HANSEN'S" AT-250
imparts a light lemon tint to a deep golden yellow hue

Superior in Convenience
Superior in Coloring Properties
Superior in Economy of Use

In these two new all vegetable food colors by Hansen's you'll find advanced, positive benefits to help you improve your product and lower your costs.

- **HANSEN'S NEW ANNATTO COLOR "BARS"** . . . preweighed, prescored for greater convenience. Completely eliminates the need for measuring out color . . . as with conventional coloring powders and liquids. Each Color Bar has been accurately weighed and scored into 50 individual squares. Simply break off the exact number of squares you need for the color shade you want.
- **CONVENIENT TO STORE** . . . Hansen's compact sized Color Bars take up but a fraction of the space consumed by coloring powders and liquids. And they require no special holding temperature — any cool, dry area is ideal.
- **PUREST FOOD COLORS AVAILABLE** . . . A-500 and AT-250 are all natural vegetable colors . . . containing no coal tar elements . . . nothing synthetic is used.
- **WIDE RANGE OF USES** . . . Because they are oil soluble, both A-500 and AT-250 are perfect coloring agents for dairy products, bakery goods, shortenings, salad oils or wherever else an oil soluble color is needed.
- **ECONOMICAL TO USE** . . . highly concentrated for maximum dispersion — *a little goes a long way.*
- **ANNATTO COLORS—THE MOST STABLE CAROTINOID IN USE.** Hansen's A-500 and AT-250 are resistant to oxidation . . . are tasteless — impart no flavor of their own to foods.

Get full details on these superior products today by writing:

CHR. HANSEN'S LABORATORY
MILWAUKEE 14, WISCONSIN

6799 on Reader Service Slip.

ingredients

Improved stability for frozen foods

The use of algin to obtain improved freeze-thaw stability in frozen foods is subject of 6-page bulletin, F #54, issued by Kelco Company.

Frozen food products utilizing algin include fruit packs, bakery foods, dairy products, cream sauces, gravies, bread mixtures, macaroni and cheese, spaghetti and pizza sauces.

Bulletin describes how coarse ice crystal formation can be efficiently retarded in frozen food products with the use of algin.

Helpful information is given showing that with algin very small ice crystals are formed on freezing and that syneresis (weeping) is minimized on thawing. Bulletin also describes how use of algin provides uniform retention of sauce or liquid on finished frozen food products during processing, delivery, thawing and cooking.

Five specific algin products that have found general application in frozen foods are described, with recommendations for their use.

6800 on Reader Service Slip.

Longer shelf-life for dry seasonings

A new form of dry seasonings, which feature longer shelf-life, are subject of brochure from Dry Materials Div., Dodge & Olcott, Inc.

Seasonings, known as Spisoseals, may be used without change in product formulation as alternates for crude spices and dry solubles.

They are prepared from natural essential oils and/or oleoresins. Through special manufacturing techniques, they are encapsulated in a protective coating which provides for their longer shelf-life.

Seasonings are easily dispersible in liquids, form stable emulsions and provide uniformity and consistency of flavor strength.

6801 on Reader Service Slip.

NEW SUPER SERIES COWLES MODELS PRODUCE SUPER RESULTS FOR FOOD PROCESSORS

Truly amazing production records are being reported for these new Cowles Models. Two things are primarily responsible.

1. The patented impeller "teeth that make the big difference".
2. The MPD* (Maximum Power Delivery) transmission system which delivers full power to the impeller even at slowest speeds.

Here are just a few of many examples.

Economical, time-saving deaeration. — Deaeration can improve quality of such food products as apple sauce, baby foods, catsup, chili, meats, vegetables, etc. Super Series Cowles Model 510 VHV efficiently and quickly removes the bulk of entrained air, in many cases avoiding use of vacuum methods which usually require heating and cooling cycles that may be both costly and time-consuming.

Additional Cowles units for salad dressing manufacturer. — Based strictly on performance, reorders for Cowles units now being placed by one of the largest international salad dressing concerns for installation in all their many plants.

Chocolate Syrup in half the time. — With Cowles hydraulic lift unit, such as Super Series Model 720-VHV, semi-automatic operation can be effected — with one tank heating and filling and the other being dispersed. If cocoa powder does not require milling, time cycle can be cut in half or even more.

Costs cut on food coloring dispersions. — Butter and other products requiring colorings in oil produced by numerous companies in less time and at less cost than other type mixers.

More and better creme fillings. — COWLES Dissolvers now being employed by several national cookie manufacturers in the production of creme fillings of various types. End products have excellent dispersions, far superior to previous ones. Volume is greater, with fewer machines in operation.

Let us prove the advantage of Cowles Dissolvers in your plant — at our risk! Write us today about your problem.

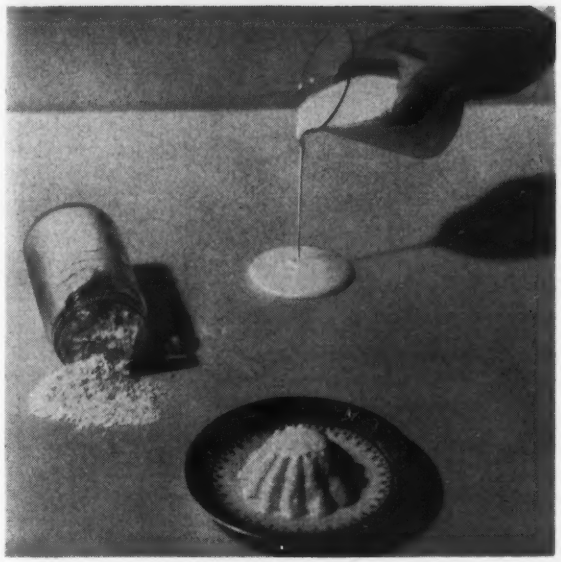
MOREHOUSE-COWLES, INC.
1150 San Fernando Road
Los Angeles 65, Calif.

MOREHOUSE COWLES
* Trademark

Representatives in Principal Cities. Convenient Lease and Time-Payment Plans

Please send me information on use of Cowles Dissolvers in processing (product) .....
.....
Name ..... Title .....
Firm .....
Address .....
City ..... Zone .... State.....
625

6802 on Reader Service Slip.



On the left, is dry, free-flowing crystalline cellulose. Mixture in beaker illustrates the smooth, heavy cream consistency that can be obtained from the crystalline cellulose. Mold on the dish indicates the formation of gels of greater rigidity with higher consistency of the dry crystals

crystalline cellulose offers many advantages as a food ingredient

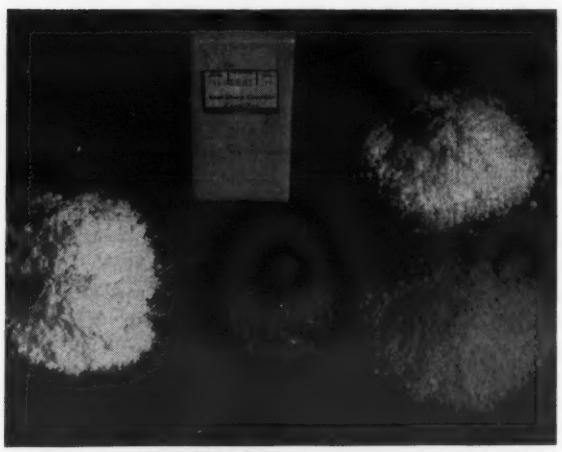
Contributes stability, body, bulk, opacity, texture and palatability to a wide variety of convenience and low-calorie foods

Crystalline cellulose, a highly purified form of cellulose existing as minute separate particles, contributes gel stability, body, bulk, opacity, texture and palatability to many convenience foods, as well as low-calorie foods.

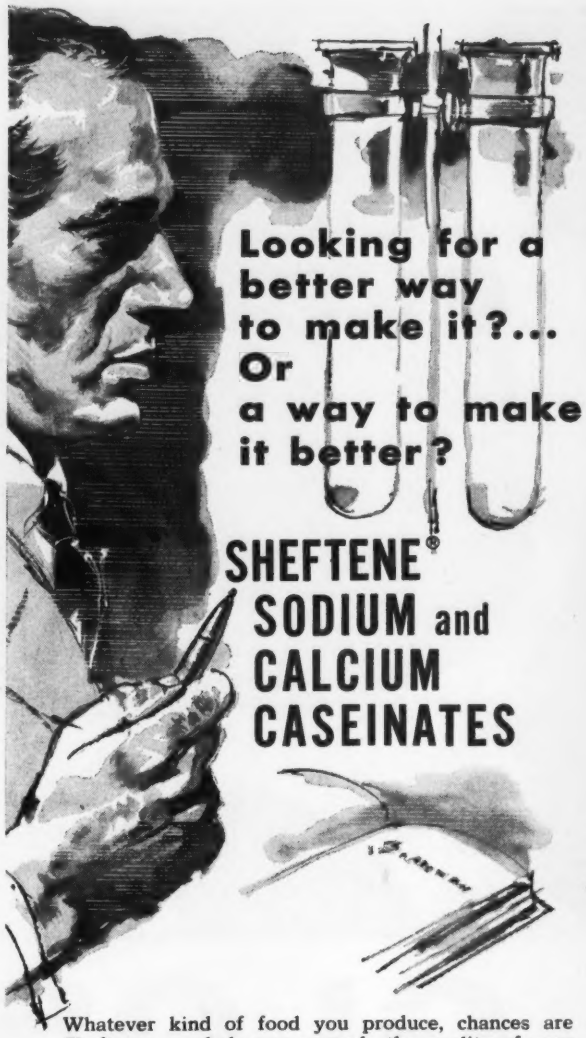
Known as Avicel cellulose, the snow-white, free-flowing powder, is both odorless and tasteless. It is generally recognized as safe and, therefore, is not considered an additive under the terms of the Food Additives Amendment.

When properly dispersed in water, the crystalline cellulose forms an extremely firm and opaque gel, having remarkable creamy texture and stability. Resulting gel is smooth, odorless and tasteless, with no calorie content.

Because of these properties,



The ability of crystalline cellulose to absorb oils and fats is shown above. On the left is the free-flowing, dry product. By adding it to peanut butter in a mixer, this spread is converted into a dry, free-flowing powder as shown in right foreground. By mixing it with cheddar cheese, the cheese can be converted into a dry, free-flowing form as shown in right background



Whatever kind of food you produce, chances are Sheftenes can help you upgrade the quality of your product or even improve its manufacturing process . . . Or both!

Primarily Sheftenes are known as a high-quality protein supplement, rich in lysine and other essential amino acids. But they offer a wide assortment of functional advantages as well.

Here's just a partial list:

Bakery: As a high-protein ingredient for bread.

As a volume controllant to insure proper texture and uniformity of doughnuts, cookies and waffles.

As a fat-blocking ingredient to prevent excessive absorption of fat in frying of doughnuts.

Dairy: As a stabilizer and emulsifier in milk shake bases.

As a low-calorie stabilizer in ice cream for diabetics.

As an agent to assure the keeping quality of ice cream.

Cereals: As a supplement to improve the "amino profile" of grain cereal products.

Infant Foods: As a high-quality, high-protein supplement in infant and special dietetic products.

For samples and technical data write Dept. FP-1160

SHEFFIELD CHEMICAL
Norwich, N.Y.
A DIVISION OF NATIONAL DAIRY PRODUCTS CORPORATION
Western U.S. distribution through
BRAUN-KNECHT-HEIMANN CO., and Affiliates — San Francisco

6803 on Reader Service Slip.

the gel is an effective ingredient in the preparation and calorie control of such foods as dressings, puddings, custards, spreads, toppings, etc.

To prepare cellulose gels, attrition in the wet state is necessary. For this purpose, a mixer that will provide a high rate of shear, equipped with a paddle attachment is satisfactory.

The dry, crystalline cellulose is attrited at 35 per cent solids for about 25 minutes, followed

Dry, free-flowing peanut butter may be sprinkled directly on a slice of bread. By mixing the dry peanut butter with water, it can instantly be reconverted into a smooth spread

by dilution with water to produce a gel of desired viscosity.

Texture of the gel may be improved by the addition of a small amount of a gum, such as alginate or low viscosity sodium carboxyl methyl cellulose.

Dry form uses

In its dry form, crystalline cellulose will tenaciously absorb fats and oils. This unique absorptive quality can be used to convert oil based foods, such as cheese and peanut butter; and syrupy foods, such as molasses and honey, into free-flowing, granulated form for use in dry mixes and convenience foods.

The product to be dried is simply placed in a suitable mixer and the crystalline cellulose slowly added until a mix of the desired dry, free-flowing texture is obtained.

For example, with the crystalline cellulose, it is possible to make a dry, free-flowing

GLOSS *Paramount Style*

How Durkee's Continuing Research Kept Coatings from Turning Gray

THE PROBLEM: *find a better hard butter.* Durkee's Technical Research Staff set out to find one. They wanted a hard butter that would produce confectioners' coatings with better performance characteristics than existing coatings. Specifically, they wanted high gloss retention, greater stability and resistance to bloom under all temperature conditions.

THE SOLUTION: *methodical.* Durkee research went to work. Coating after coating was tested in the laboratories . . . placed in cycling cabinets which duplicated shelf temperature changes . . . checked by taste panels . . . subjected to exact conditions encountered in the plant. Durkee even built a pilot plant with miniature equipment to simulate actual plant conditions. As a result, a hard butter for making coatings that met every industry requirement was developed. Durkee named it Paramount; confectioners call it "wonderful".

THE SIGNIFICANCE: *clear.* Durkee has been researching fats and oils for 40 years—and is still hard at it. The development of Paramount is typical of purposeful research continually in progress in Durkee's Technical Service Laboratories. Here is where we may be able to help you most whenever your product or process warrants further attention. We'd be glad to help. Just 'phone us or write.

DURKEE TECHNICAL SERVICE

Department FP • 900 Union Commerce Building • Cleveland 14, Ohio

Jamaica, N.Y. • Louisville, Ky. • Berkeley, Calif. • Chicago, Ill.

QUALITY Glidden PRODUCTS

6804 on Reader Service Slip.

peanut butter that can be simply sprinkled on bread. By mixing the dry peanut butter with water, it can instantly be reconverted into a smooth spread.

Crystalline cellulose is a stable product which may be safely stored under normal humidity and temperature conditions. It is available in limited quantities for laboratory evaluation. A small commercial plant, to increase crytalline cellulose production, is under construction and is scheduled to be operating by January, 1961.

Supplier: American Viscose Corporation, Corporate Market Development Dept., Marcus Hook, Pa.

6805 on Reader Service Slip.

Increased use of animal fats in livestock feeds

A 30-fold increase in the use of animal fats in livestock feeds has occurred since the early 1950's.

This fact was disclosed in a recent re-evaluation of the use of animal fats in poultry and other feeds, made by O. G. Rasmussen and Dr. O. H. M. Wilder of the American Meat Institute Foundation's Division of Animal Feeds.

More than 549 million pounds of feed grade fats were used in feeds in 1958, the most recent year for which total figures are available.

In 1959, the figure is estimated to have climbed to about 553 million pounds. Animal fats used in feed in 1959 had a total value of about $28 million.

Published research on the use of animal fats in feeds is scattered throughout the literature of the world.

Since the data on such research in these published reports are of marked value to those interested in animal nutrition, Mr. Rasmussen and Dr. Wilder have compiled a bibliography of information published from January, 1952 through November, 1959.

This "Bibliography on the Use of Animal Fats in Livestock Feeds", Foundation Cir-

WILL THE RUSH TO POLY-UNSATURATED OILS COST YOU SALES?

Consumers are becoming highly conscious of the benefits of poly-unsaturated fats in the foods they eat.

This is no food fad. It's a definite, established trend: one that's based on sound health reasons . . . one that's just beginning to make its impact felt.

If you use fats or oils in the foods you process or package, *now* is the time to analyze the effect this trend will have on your sales.

CHECK SAFFLOWER OIL NOW!

Now is the time to consider the advantages you get from PVO Safflower Oil — the versatile oil with a higher poly-unsaturated content than any other vegetable oil available.

Check these advantages:

- ✓ **76.5% Linoleic Poly-Unsaturates (Only 10.5% Saturates)**
- ✓ **A Ratio of 7.6 to 1—Poly-Unsaturates to Saturates**
- ✓ **Bland Flavor**
- ✓ **High Smoke Point**
- ✓ **Long Cold Test**

Write today — or contact your PVO broker — for all the information on Safflower Oil by PVO process.

PACIFIC VEGETABLE OIL CORP.

DEPT. FP 1160 • 1145 SOUTH TENTH STREET • RICHMOND, CALIFORNIA

6806 on Reader Service Slip.

cular 58 (publication F-399), is available from H. A. Armstrong, Chief of Information and Service, American Meat Institute Foundation, 939 East 57th Street, Chicago 37, Illinois.

Mushroom concentrated flavor in dried or liquid form

Fritzbro Mushroom Concentrate, a mushroom flavoring compound in liquid or spray-dried form, may be used in gravies, meat products, salad dressing, cheese dips, etc.

A natural product extracted from selected imported mushrooms, it has been tested by independent laboratories and found to be free of all types of molds, bacteria and fungi.

Its use eliminates the problems and necessities of storage, fumigation and cleaning associated with the use of imported mushrooms. The concentrate is also said to have four to five times the latter's flavor strength and even greater than that of the domestic mushroom.

It mixes easily with water and dilute alcohol and disperses readily in fats and oils.

Supplier: Fritzsche Brothers, Inc., Port Authority Bldg., 76 Ninth Ave., New York 11, New York.

Concentrated butter color

An oil-soluble colorant, called Hansen's Hi-Concentrate Annatto Butter Color, is a highly purified extract of annatto seed.

Principal advantage with the product is the time and work savings it affords in coloring operations. It is easy to work with and can easily be cleaned from measuring containers. It can be rinsed completely from

For more information on product at right, circle 6809 . . . see information request blank opposite last page.

HERCULES

"BEEF-UP" YOUR REPEAT SALES WITH HVP-CENTURY

The initial sale is important but volume is built on repeats. That's why so many food processors are including Hercules HVP®-Century powdered in their formulations for the flavor of well-browned beef. It's a flavor that brings satisfied customers back to the counter again for "seconds."

HVP-Century, a total hydrolyzed vegetable protein derived from wheat protein, contains 100% of all the amino acids derived from the hydrolysis with none of the monosodium glutamate removed.

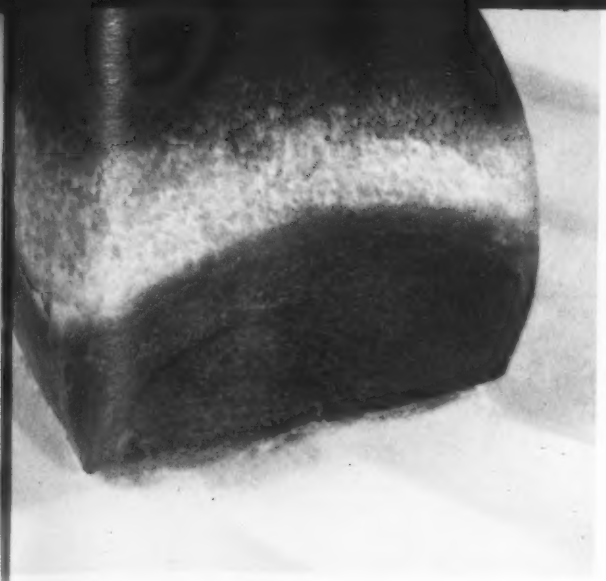
The latest addition to Hercules' full life of HVP powder and liquids and MSG, HVP-Century offers many possibilities for cost savings and processing advantages.

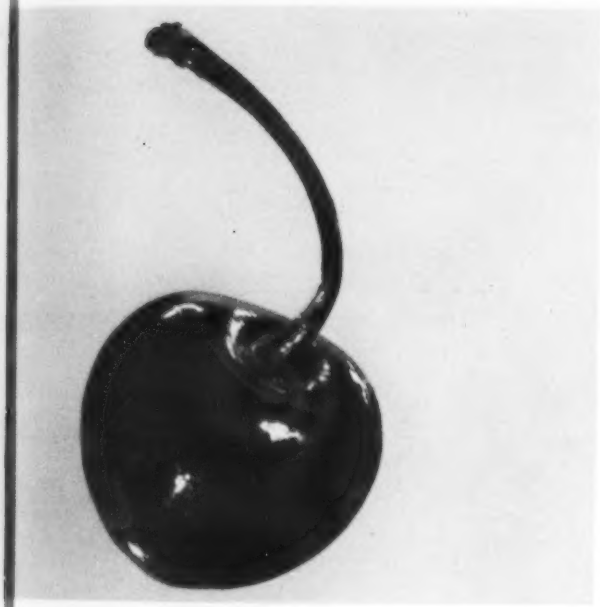
A four-page data sheet is available to provide complete specifications on HVP-Century as well as information on how to compute cost savings and convert formulations. A data sheet and a sample of HVP-Century, which has FDA acceptance for use in many applications, can be obtained by writing:

Huron Milling Division, Virginia Cellulose Department
HERCULES POWDER COMPANY
INCORPORATED
Hercules Tower, 910 Market Street, Wilmington 99, Delaware

VH60-7

6807 on Reader Service Slip.





avorful, quality, eye-appealing foods...

naturally superior...when made with...

sugars, starches and syrups from

INDUSTRIAL DIVISION
CORN PRODUCTS
COMPANY

WRITE OR PHONE *Corn Products for expert technical assistance... helpful data on these fine products for the Food Industry:*

CERELOSE® dextrose sugar · REX® and GLOBE® corn syrups · BUFFALO® · HUDSON RIVER® and SNOWFLAKE® starches.

CORN PRODUCTS COMPANY INDUSTRIAL DIVISION · 10 East 56 Street, New York 22, N. Y.

MYVACET® Distilled Acetylated Monoglycerides are now approved for edible use

These products, whose research studies have disclosed many interesting properties, are now ready for your new product development program. Sec. 121.1018, U. S. Food and Drug Regulations, authorizes their use, up to 5% in finished food, as

"(1) A food coating agent
(2) A food container component
(3) An equipment lubricant
(4) An emulsifier in food."

We have prepared Bulletin A-1 to give general information on this subject; included are a list of 69 pertinent scientific papers and patents and a compilation of many suggested uses. These range from slab oils to shortenings, and include coatings for foods as well as plasticizers for other coating materials.

Other bulletins are now available which give information on specific applications:

A-2. Poultry
A-3. Frozen and Processed Meats
A-4. Frozen Fish
A-5. Dried Fruits
A-6. Nuts and Candies
A-7. Storage Eggs

Food processors are welcome to copies of these bulletins, as well as samples of different types of *MYVACET Distilled Acetylated Monoglycerides.*

Information and quotations from ***Distillation Products Industries,*** Rochester 3, N. Y. Sales offices: New York and Chicago • W. M. Gillies, Inc., West Coast • Charles Albert Smith Limited, Montreal and Toronto.

distillers of monoglycerides made from natural fats and oils

DPi

Also . . . vitamin A in bulk for foods and pharmaceuticals

Distillation Products Industries *is a division of* **Eastman Kodak Company**

6810 on Reader Service Slip.

graduates, beakers, etc., even with cold tap water with absolutely no scrubbing.

Waste is eliminated since the rinsed colorant can be introduced at full strength to the butter in processing.

Color dispersion is accomplished quickly and easily with the product because it can be added to the cream so that the buttermaker has full control over the mixing and stirring process with better, more uniform results, and no loss of color.

Supplier: Chr. Hansen's Laboratory, Inc., 9015 W. Mapel St., Milwaukee 14, Wis.

6811 on Reader Service Slip.

Mold inhibitor lengthens feed storage life

By addition of up to 0.4 per cent "Impedex" sodium propionate NF to feed formulas or feed ingredients during processing, storage life may be doubled or tripled.

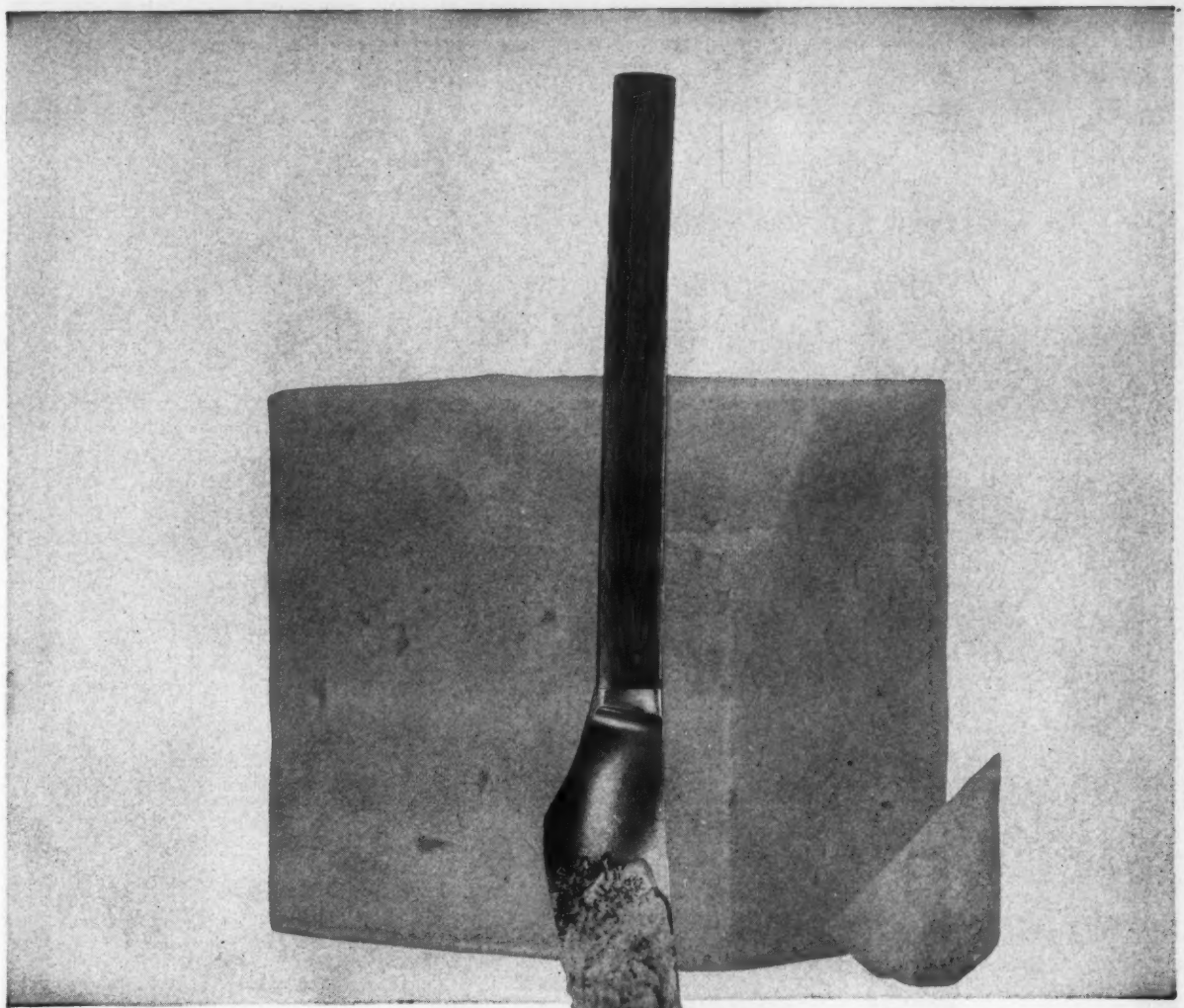
Sodium propionate and calcium propionate have been used for over 20 years by the baking industry to inhibit mold in bakery foods. Studies at the Texas Agricultural Experiment Station revealed that they were similarly effective in the protection of corn meal.

As a result of the Texas studies, the Du Pont Company undertook further studies for the development of a suitable formulation and commercial recommendations for the feed industry.

Studies included corn meal, brewer's wet and dried grains, fish meal, vegetable oil meals, molasses, dog food, horse feed, pellets of coastal Bermuda grass and various common types of rations for dairy cattle, beef cattle and poultry.

Degree of protection resulting from various percentages of sodium propionate NF was found to depend on the moisture level, storage temperature and pH of the feed, as well as the viability of mold spores present.

Effect was improved by reducing pH of the feed or by adding salt. With or without propionate NF, feeds remained



You're sure . . . when
it's a "chip" off the KRAFT block!

It looks like powder, but it's real Kraft cheese—natural, aged cheese—in dry form. Always of Kraft quality, always of uniform flavor without seasonal variations! So you can always depend on Kraft dry cheeses to maintain the uniform, good taste that your customers demand in your cheese-flavored items. Use Kraft to make all your present cheese-flavored foods even better—and to develop new items for extra sales. Kraft cheeses are so easy to handle, too. In the drying process they become free-flowing—and store better as well, without refrigeration problems. Choose from these Kraft products . . . one is just right for you. CHEEZTANG—selected aged natural Cheddar cheeses, in white or golden color. CHE-ZING—a pasteurized blend of Cheddar cheese solids and milk powder. ROKA CHEESE FLAVOR—a blend of Cheddar cheese, blue cheese and milk powder. All by Kraft!

KRAFT

Ask your Kraft Man, or write Kraft Foods Industrial Products Division, 500 Peshtigo Ct., Chicago 90, Illinois

6812 on Reader Service Slip.

mold-free about twice as long at 70 F as at 90 F.

Reduction of pH by one point doubled effectiveness of sodium propionate NF in preventing mold. But reducing pH of feeds without sodium propionate NF to as low as 3.7 had no effect on heating and molding.

For fish meal, a combination of sodium propionate with salt was found more effective than either one alone. For fish meal which started to heat after six days of storage at 90 F, 0.2 per cent sodium propionate NF plus 2.0 per cent salt increased heat-free life to 29 days.

Sodium propionate has been listed by the Association of American Feed Control officials as an accepted mold inhibitor, and must be shown on the label when used.

It was also listed by FDA as a "substance generally recognized as safe" in the Federal Register, November 20, 1959.

Supplier: E. I. du Pont de Nemours & Company, Wilmington 98, Del.

6814 on Reader Service Slip.

Reviews uses for 94 processing chemicals

Ninety-four organic and inorganic chemicals for industry and agriculture are reviewed in a 16-page, quick-reference digest issued by Hooker Chemical Corp.

The bulletin, No. 100-D, gives useful information covering 88 commercially produced chemicals and six development products. Included are more than 20 new or recently developed chemicals.

Among the chemicals included are certain acids, alkalies, the elements chlorine and phosphorus, metallic salts, phosphorus compounds, sulfur compounds, chlorides, chlorobenzenes, etc.

A thumbnail description, physical data, chemical formula, uses and types and weights of shipping containers are presented for all 94 chemicals listed.

6815 on Reader Service Slip.

WILL **DIAMOND CRYSTAL FLAKE-TYPE SALT ENHANCE THE QUALITY OF YOUR FOOD!**

Diamond Crystal Salt is made by the exclusive Alberger process which produces a flake-type salt that is uniformly 99.95% pure. This amazingly high purity combats the danger of costly spoilage . . . helps prevent "off flavoring". . . and protects and enhances the quality of your product.

Diamond Crystal Flake-type Salt permits "maximum salting" for best flavor development in your product without the bitterness that is imparted by ordinary salt containing calcium, magnesium and metallic impurities. A less pure salt than Diamond Crystal Flake-type could form unappetizing scums and discolorations on vegetables, or stimulate oxidative rancidity in foods containing fats and oils.

Diamond Crystal Flake-type Salt is precision screened to provide a wide range of sizes to meet all your requirements.

Why not use the service offered by Diamond Crystal's staff of trained food specialists who will assist you in selecting the proper type salt for your product? For more information, call the nearest Diamond Crystal sales office or write to Diamond Crystal Salt Co., St. Clair, Michigan.

Diamond Crystal Salt Co.
ST. CLAIR, MICHIGAN

Sales Offices: Akron • Atlanta • Boston • Charlotte
Chicago • Detroit • Louisville
Minneapolis • New Orleans • New York

Plants: Akron, Ohio • Jefferson Island, Louisiana
St. Clair, Michigan

6813 on Reader Service Slip.

Research for the food industry

"Food" a 24-page brochure reviewing research for the food industry, has been issued by Merck & Co., Inc. Brochure explains the various Merck services available to the food industry.

It tells of efforts to uncover new and more effective ways to fulfill the need for new methods to safeguard original food freshness and nutritive values and, at the same time, increase operating efficiency starting with harvesting and continuing through processing and distribution.

Illustrated with large, striking photographs, the brochure outlines the functions of the microbiology laboratory, the chemical laboratory, the testing kitchen and the application laboratory; and shows how they help in solving the problems confronting food processors.

It also outlines the close relationship between the scientists at the food laboratories and the Merck agriculture and Merck animal feeds laboratories as well as the Merck engineering department.

A comprehensive chart summarizes the Merck products used in food processing.

6816 on Reader Service Slip.

Catalog of essential oils, certified colors

A complete line of essential oils and certified colors are included in a 36-page catalog from Dodge & Olcott, Inc.

Among products listed are 235 essential oils, 8 concentrated citrus oils, 24 oleoresins, 23 terpeneless oils, 13 balsams and gums and 36 certified food colors.

Container size and price per pound are given as part of the information on the various products. Special section in catalog also discusses spray dried products and includes a list of special flavor lines for specific purposes.

6817 on Reader Service Slip.

Try this texture trick

Pour ½ cup of plain, dry farina and a teaspoonful of salt into 3 cups of boiling water and cook until done. To another ½ cup of the same dry farina, add 3% of *Myverol® Distilled Monoglycerides, Type 18-07*, little white beads closely resembling the farina itself in appearance. (Write us for a free sample.) Pour *that* with its teaspoonful of salt into 3 cups of water, not boiling but at any temperature below 140 F. Then boil *that* until done.

Now set both pans aside for a few hours. Keep them both warm or let them both cool. It doesn't matter.

Come back and note which panful has turned into a jellylike mass and which still looks and behaves as it did at the moment the cooking was finished. See if you can taste a difference. (You can't.)

The difference is that the monoglyceride has complexed dissolved amylose and has thereby prevented gelation. The effect works with any starchy food.* We demonstrate with farina just because it photographs well!

Write for your sample of *Myverol Distilled Monoglycerides, Type 18-07*, to ***Distillation Products Industries,*** Rochester 3, N. Y. Sales offices: New York and Chicago • W. M. Gillies, Inc., West Coast • Charles Albert Smith Limited, Montreal and Toronto.

*Being made by glycerolysis of edible fats or oils and officially recognized as safe, *Myverol Distilled Monoglycerides* are exempt from the Food Additives Amendment.

distillers of monoglycerides made from natural fats and oils

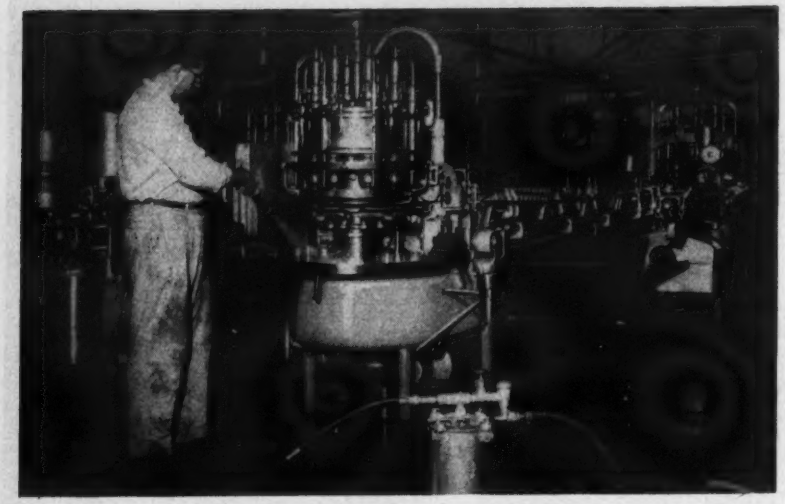
DPi

Also . . . vitamin A in bulk for foods and pharmaceuticals

Distillation Products Industries *is a division of* **Eastman Kodak Company**

6818 on Reader Service Slip.

The big PLUS SERVICE EXPERIENCE RESEARCH PERFORMANCE in Oakite



New General Cleaner! Oakite LIQUI-DET® No. 2 banishes toughest food soils

Cooked on or dried on chocolate, egg, milk, syrups . . . try it on the toughest food soil you can, and see how new Oakite Liqui-Det No. 2 wets through it with ease. What's more, Liqui-Det No. 2 produces good suds for vigorous cleaning action . . . rinses thoroughly with no trace of film or water spotting . . . contains no odor-producing solvents . . . is safe for any food-contact surface.

Just mix an economical ½ to 2 ozs. in a gallon of water; wipe, mop or spray it on; mop, wipe or hose it off. Surfaces sparkle. Stainless steel, especially, looks *newer* after each washing.

Liqui-Det No. 2 is the latest general cleaner for food preparation areas. And it's the best yet. Try it!

THE BIG PLUS IN OAKITE

Ask the Oakite man to demonstrate Liqui-Det No. 2 in your plant. Working with him is like adding a consulting sanitation engineer to your staff. It gives you the latest research results in cleaning. It means an end to costly waste of time and materials. It brings mechanization to tedious chores. It *guarantees* materials that do the job. Send for Bulletin B-8165, which tells more. Oakite Products, Inc., 26G Rector Street, New York 6, N.Y.

OAKITE SCIENCE

over 50 Est. 1909 years' leadership in industrial cleaning

Technical Service Representatives in Principal Cities

Export Division Cable Address: Oakite

6819 on Reader Service Slip.

Trouble keeping pipe

13 sizes of 'humped' aluminum ells protect 109

Ells may be used as "mold" for insulation, technique which is illustrated above, or they may be used over prefabricated insulation and mitred joints. When the aluminum elbows are used as a mold, the two halves are partially packed with insulating cement. After broken insulation has been removed, ell halves are applied and permanently fastened by two metal bands. Insulating cement on inside molds itself around pipe

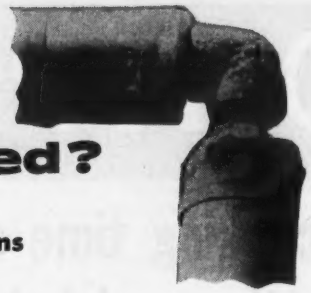
KEEPING INSULATION on pipe lines — especially elbows — is always a problem when lines are close to operating areas or processing equipment.

Deterioration of pipe insulation most frequently starts at elbows in line. Cracks invariably occur between elbow and straight-run insulation because of thermal expansion. Once insulation is cracked, deterioration usually proceeds rapidly.

Fast method of insulating pipe ells and at same time protecting insulation is made possible by prefabricated, aluminum elbows, made by General Aluminum Supply Company, 1506 Eastern Ave., Kansas City 26, Mo.

Humped Aluminum Elbows, as their name implies, have a contour which does not follow a true radius of curvature. Hump at angle provides space for various pipe sizes and insulation thicknesses. Ends of the ells are designed to provide a snug fit over straight-run insulation.

Humped elbows compensate for pipe expansion; will fit either long- or short-radii ells.



ells insulated?

pipe-insulation combinations

Less than five minutes are required for insulating and jacketing ells. Finished job is neat in appearance; involves no cutting or fitting, no coatings or clean up

They come in two pieces and are easily installed with metal bands or screws, see photos above. Made of heavy gauge (0.025-0.032) aluminum, ells are smooth skinned and free of wrinkles.

Because of humped design, only 13 sizes of ells — from 3 in. through 12.81 in. OD — are necessary to cover 109 combinations of pipe-elbow sizes and insulation thicknesses.

Thus interchangeability is achieved which, combined with permanence of metal, enables aluminum ells to be used over and over again.

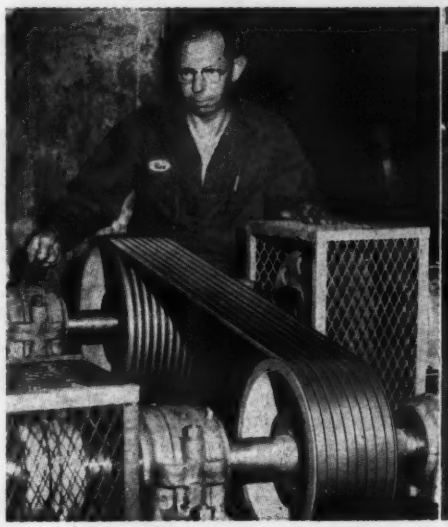
Regardless of insulation material used, pipe ells can be insulated at same time as rest of line. That is, aluminum ells can be installed without breaking "insulating pace." Pace is broken when standard methods (insulating, tying, applying several coats of cement etc.) are used.

Time savings become particularly advantageous when overhead work has to be done on scaffolding; there is no waiting time for cements to dry on elbows.

Since the two halves can be quickly removed and reapplied, inspection of pipe ells for leaks or pits can be readily accomplished. Also, keeping ells clean is easy since there are no folds or wrinkles to act as dirt catchers.

6820 on Reader Service Slip.

2 ways Gates high capacity V-Belt Drives contribute to industry profits



ON IN-PLANT EQUIPMENT, Gates Super HC V-Belt Drives lower maintenance costs—as on this pump at Scott Paper Company's Detroit plant. The pump was formerly driven by a special belt, but 6 of these belts failed in about 3 months. In comparison, a Super HC Drive has been operating for the past year with NO down time and NO replacement cost.

ON EQUIPMENT FOR SALE, Super HC High Capacity V-Belts produce savings all down the line—as on these sand pumps being readied for shipment from Denver Equipment Company's plant. With Super HC, sheave dimensions can be reduced 30% to 50%, overall space up to 50%, drive weight by 20%, and drive cost by as much as 20%, compared to previous drives.

A little more than a year ago Gates introduced a new high capacity V-belt—a slimmer, tougher, more flexible V-belt with far greater capacity to transmit horsepower than conventional belts.

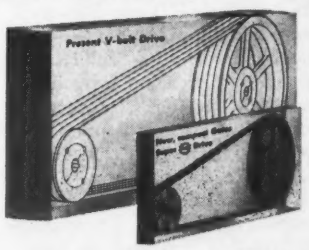
Because this revolutionary V-belt permits narrower sheaves, fewer belts, and closer center distances, hundreds of plants across the country have found Gates Super HC V-Belt Drives contribute to profits in 2 ways: through marked savings in drive costs on production machines *within* the plant and on powered equipment manufactured *for sale*.

Gates V-Belt Distributors and Field Engineers are listed in the Yellow Pages in all major industrial centers. Ask your distributor for the handbook, *The Modern Way to Design V-Belt Drives.* TPA 544

The Gates Rubber Company, Denver, Colorado
Gates Rubber of Canada Ltd., Brantford, Ontario

Gates

The Mark of *Specialized* Research



same hp capacity in smaller "package"

GATES SUPER HC HIGH CAPACITY V-BELT DRIVES

Stops rust action, prepares rusted metal for paint

Metal treatment product, known as Ospho, may be applied directly on rusted metal, eliminating the need for extensive surface preparation. It chemically changes rust, (iron oxide) into iron phosphate, producing an inert, hard, gray surface.

Rust action is stopped and paint applied over the treated surface adheres so tightly that moisture cannot get through to attack the metal. Thus, the paint lasts and protects the metal much longer.

Product also provides a good bond between new metal and paint. It may be applied by spray or brush and will dry in approximately 6 hours.

It may also be used to touch up rusted spots as it will not harm adjacent painted surfaces.

Ospho is available in gallon bottles (in cases of four), 5-gallon pails and 50-gallon barrels.

Supplier: Rusticide Products Company, 3125 Perkins Ave., Cleveland 14, Ohio.

6822 on Reader Service Slip.

Glass covers protect fluorescent lamps from light-robbing cold

Fluorescent type lamps do not give off light with normally high efficiency when exposed to low temperatures. Some deliver as little as 10 per cent of their rated light output at 0 F.

Plantation Cold Storage, Miami, Fla., found this out after replacing thirty 500-watt incandescent lamps with a fluorescent system. They tried first one fluorescent type lamp and then another without getting light levels adequate for seeing to handle frozen foods they store for packers.

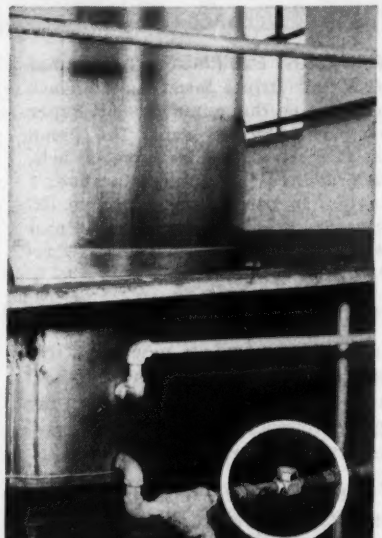
Glass-jacketed fluorescent lamps, originally introduced for outdoor lighting in temperatures down to −20 F, have overcome the problem. Fourteen of the fixtures, each containing two 200-watt, eight-

SARCO TOPICS

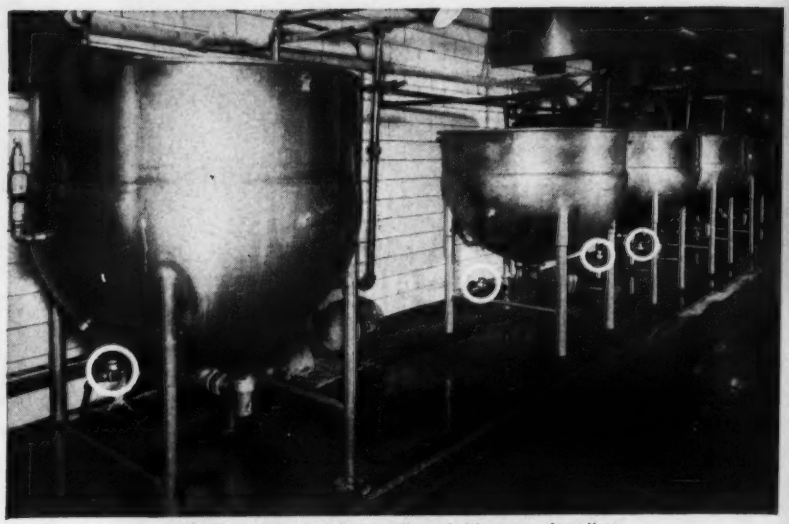
How to reduce cooking time and trap maintenance in kettles and holding tanks

College Inn Food Products Corp. of Chicago faced a problem familiar to many food processors: excessive heat-up time for kettles and holding tanks, and time lost for steam trap maintenance. They found old-fashioned bucket traps at the root of this costly problem.

Specifically, College Inn wanted to shorten both cooking and recovery time in their 150-gallon jacketed kettles... cut heat-up time for both the kettles and their 1000-gallon holding tanks... materially reduce down-time for trap repairs or replacement.



Heat-up time on storage tanks like this one has been reduced approximately 20%. The 1" TD-50 trap on this application replaced a 1½" bucket trap.



With TD-50 traps installed on these kettle rows, down-time for trap maintenance is virtually nil — over years of service.

These problems were solved by installation of Sarco Thermo-Dynamic Steam Traps, Type TD-50 to replace bucket traps. On slow cook kettles the ½" size was installed; on fast cook kettles, the ¾" size; 1" traps went on the 1000-gallon storage tanks.

Results were evident at once: Heat-up and cooking time was reduced on all kettles. Where each kettle row had previously required two or three hours per week of shutdown for bucket trap service, maintenance has now dropped to practically zero. Some traps have been in constant service for three years without attention. These results, though noteworthy, are typical. They were achieved because the TD-50 always discharges condensate as rapidly as it is formed; it cannot collect and slow down schedules.

Plant Engineer John Maurisak says: "I'm happy because of freedom from trap maintenance problems, and the cooks are happy because of the fast recovery of the kettles."

Other food processing problems will yield to Sarco TD-50's too. Where slugs of condensate and wet steam disturb processing, the TD-50 can be used to control moisture content automatically, easily. Kettle cold-spots caused by a faulty trapping system which does not discharge condensate and air adequately, can be cleared up easily with TD-50's. Other advantages include simplified piping, saved space (because TD-50's are much smaller than conventional traps), easily maintained cleanliness of surroundings.

4189

For information on Sarco Thermo-Dynamic Steam Traps, Type TD-50, contact your Sarco Sales Representative, district office, or distributor, or write.

SARCO

SARCO COMPANY, INC.
635 MADISON AVENUE, NEW YORK 22, N. Y.
PLANT: BETHLEHEM, PA.

STEAM TRAPS • TEMPERATURE CONTROLLERS
STRAINERS • HEATING SPECIALTIES

SARCO

Here are 7 Sound Reasons Why the Thermo-Dynamic® Does a Better Job of Trapping

1. *Simplicity*—has only one moving part. 2. *Maintenance*—practically zero. 3. *Wide pressure range*—one trap for all pressures from 10 to 600 psi. 4. *Uniform performance*—operates equally well on heavy, light, or no condensate load. 5. *Operates against back pressures*—up to 50% of inlet pressure. 6. *Rugged*—unaffected by superheat, water hammer, vibration, or corrosive condensate. 7. *Minimizes inventory* of spare parts.

Maintenance Time: 40 Seconds. If it now takes your maintenance crew more than a couple of minutes to service an ordinary trap, you're throwing away valuable time. This Sarco Thermo-Dynamic can be cleaned, blown out if necessary, and reassembled on the line in as little as 40 seconds.

For Prompt Information on the TD-50 . . . or for fast help on the efficient solution of any steam trapping problems, get in touch with a SARCO District Office, Sales Representative, or Distributor. (There's one near you.)

Only SARCO makes all 5 types: Thermo-Dynamic* • Thermostatic • Liquid Expansion • Float Thermostatic • Inverted Bucket

*U.S. Pat. No. 2,817,353 TM Reg. U.S. Pat. Off. 1409

SARCO

SARCO COMPANY, INC.
475 MADISON AVENUE, NEW YORK 22, N. Y.
PLANT: BETHLEHEM, PA.

6823 on Reader Service Slip.

foot-long lamps of the outdoor type, were installed.

These fixtures provide twice as much light, with only about one-third as much heat as was produced by the original incandescent lighting system. Other areas in the Plantation Cold Storage plant will receive the new lighting with jacketed lamps in 26 additional fixtures.

Designated T-10/J, the lamps deliver peak light output at −20 F and perform efficiently both indoors and out-of-doors. They are available in four-, six- and eight-foot lengths.

Supplier: General Electric Company, Nela Park, Cleveland 12, Ohio.

6824 on Reader Service Slip.

Prevent corrosion with plastics

Plastic fittings and fabrications for corrosive applications are covered in 4-page bulletin from Argo Plastic Products Company. Many of the plastic items, widely illustrated in bulletin, have been used as direct replacements for metallic structures.

Among items described and shown are complete fume removal (exhaust) systems with all component fittings, air washers, processing equipment including molded tanks, fabricated tanks, tank liners and specialty items and process piping with fittings and valves.

Plastic materials used are polypropylene, polyethylene and polyvinylchloride.

6825 on Reader Service Slip.

Use sound waves to get rid of rats

A high-frequency Dynamic Sound device has proved its ability in laboratory and field tests to clear buildings of rats and mice within 72 hours.

One device, measuring only 20" by 31½", can serve up to 120,000 square feet of building area with the aid of as many transducers or speakers as necessary.

The vibrations, created by

Another case history on TORIT Dust Collectors

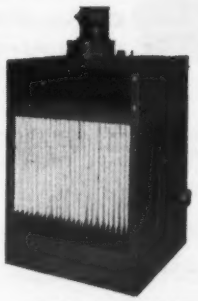
"THE GRIEVANCE COMMITTEE IS HERE . . . ABOUT THAT DUST AGAIN!"

"This was the third time in a month that the grievance committee had complained about the dust in the shop. And this time they wanted to know what I intended to do about it.

"Frankly, I was on the spot. Oh, not that I blamed the workers. I knew the shop was dirty. How could it be anything else with grinding machines running 16 hours a day? And I was as unhappy about the situation as the employees were. Poor employee morale was serious enough—and absenteeism, machine wear, misalignment and down time caused by dust was costing plenty.

"Then I remembered a salesman with a dust collecting machine system had called on me a few months back. I dug his card out of the file and found he was from the Torit Company. I got him in pronto—and I bought one of his Model 90 Cabinet machines for less than $1,000. It services four surface grinders and it really performs. A month later I had Torit Dust Collectors installed for the rest of the machines.

"Torit Dust Collectors have practically eliminated the dust in our shop. And you can imagine the effect this has had on employee morale. People are happier and healthier. Absenteeism is no longer a problem and our production rate is higher than ever."



Cabinet Model 90

Torit can solve your dust problems. For complete facts on dust . . . and how to control it . . . write

TORIT manufacturing company

1133 Rankin St., St. Paul 16, Minn., Dept. 831

6826 on Reader Service Slip.

electrical impulses, at which the machine broadcasts are of such high frequency that they can be heard only by rats and mice.

When rats and mice hear these high frequency sounds, they immediately try to escape beyond the broadcasting range of the instrument. During their flight, they become highly vulnerable to other, traditional extermination devices.

Powdered poison can be placed over the rats' "runs" or known exits from a building so that it cannot be avoided during the forced exodus. This poison will then take effect after the rats have left an enclosed area, eliminating the problem of poisoned rats dying inside a building.

An important feature of the high-frequency dispersal unit is that rats and mice cannot build up an immunity to its broadcasting. The sound pressure waves are extremely erratic in range, never duplicating the same pattern until long after the endurance time limit of any rats in habitation.

A time clock mechanism permits scheduled broadcasting dispersal hours, particularly at night when rodents are most active and destructive.

Machine is available on outright sale or lease basis.

Supplier: Dynamic Sound, Inc., 15235 Lorain Ave., Cleveland 11, Ohio.

6828 on Reader Service Slip.

Overhead cooler doors save space, provide airtight fit

Overhead-type cooler doors for refrigerated warehouses are styrofoam insulated and fully gasketed to help maintain a constant 34 F interior temperature. Cam action sealing mechanism insures an airtight fit yet provides easy operation.

Called Overdoors, they permit a working opening space twice as large as sliding or swinging doors, yet require less operating space.

Because they roll up into unused ceiling space, the overhead cooler doors cannot

The Squeeze Is on FOAM

with Dow Corning Silicone Defoamers*

There's a *right* tool for every job. In foam control it's Dow Corning silicone antifoamers or defoamers . . . job-proved thousands of times over as the most efficient, most economical, and most versatile foam suppressors available.

*At prescribed levels, are sanctioned by FDA

FREE SAMPLE
and new manual on foam control

first in silicones
Dow Corning CORPORATION
MIDLAND, MICHIGAN

Dept. 3911

Please rush a FREE SAMPLE of a Dow Corning silicone defoamer for my product or process, which is (indicate if food, aqueous, oil or other): _____

NAME _____

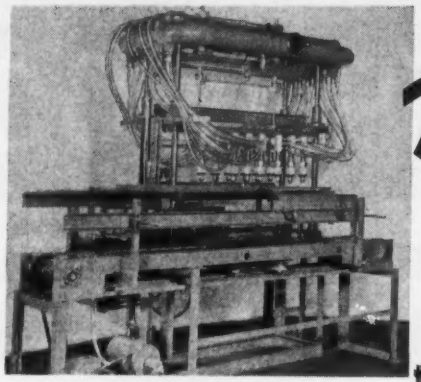
POSITION _____

COMPANY _____

ADDRESS _____

_____

6827 on Reader Service Slip.

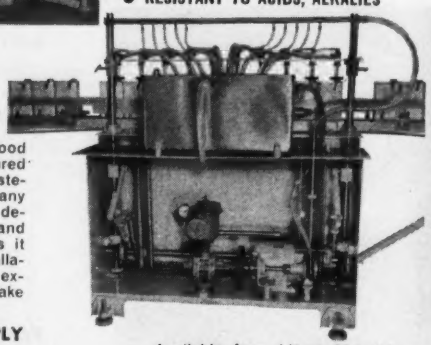


EXPECT BETTER PERFORMANCE FROM

Mayon

***Pure vinyl* food TUBING**

- NON-TOXIC, ODORLESS, TASTELESS
- STERILIZABLE, NON-OXIDIZING
- CRYSTAL CLEAR, FLEXIBLE
- RESISTANT TO ACIDS, ALKALIES



HIGHLY PERFECTED FOR INSTALLATION ON LIQUID FOOD HANDLING MACHINES AND EQUIPMENT

When you specify MAYON pure vinyl food tubing in any installation, you are assured of the utmost in quality . . . odorless, tasteless, non-toxic, and highly resistant to any acid or alkali action; even the strongest detergents. The high degree of flexibility and toughness of this finer tubing makes it particularly adaptable to intricate installations. The glass-smooth interior and exterior surfaces resist abrasion and make cleaning easy.

Available from ⅛" to 2" inside diameter. Continuous lengths up to 100 feet. Available with stainless steel braid for high pressure applications. All ingredients sanctioned by Food & Drug Administration.

ASK YOUR EQUIPMENT SUPPLY HOUSE, OR WRITE TO:

MAYON PLASTICS
415-17TH AVE. NO. • HOPKINS, MINN.
Phone: WEst 5-2187

6829 on Reader Service Slip.

STANcase STAINLESS STEEL EQUIPMENT

SANITARY DRUMS
Of 16-gauge Stainless Steel with polished and seamless inner surfaces, rolled top rims, extra heavy-gauge foot rings, bottoms raised from floor. In three sizes of 30-55-60 gallon capacities.

Shown are but a few popular models of STANcase Stainless Steel Equipment designed to meet the varied needs of all Food Handling Plants. Each product, ranging from Scoops and Ladles to Cooking Kettles and Tables, represents the very utmost in Functional Design and Sanitary Efficiency, requiring minimum maintenance with greatest cleansing ease. Rugged heavy-gauge construction or lightweight streamlined design assures economy of LONG LIFE SERVICE & OPERATION EASE.

FOOD HANDLING TRUCKS

No. 48

SCOOPS & MEAT FORKS
All Stainless Steel seamless construction. Lightweight, Sanitary Efficiency designed for heavy duty.

Standard, Tilting, straight-sided or tapered, with or without chimes. 8 to 20 Quart capacities. Finest construction features.

STAINLESS STEEL PAILS

To select products in the Sizes and Capacities you require and to discover New Aids for Food Handling Efficiency, SEND FOR NEW STANcase CATALOG No. 60.

The Standard Casing Company, Inc. 121 Spring St., New York 12, N.Y.

6830 on Reader Service Slip.

be damaged by dock traffic and may be easily opened after the truck is back up to the dock for loading.

Exterior of doors are weather treated to keep them looking new and to reduce maintenance.

These overhead-type cooler doors are being used on the

Doors roll up into unused ceiling space and provide a wide unobstructed opening to permit easy loading of route trucks

new suburban route refrigerated warehouse being built by Menzie Dairy Company, Pittsburgh, Pa. Each door of the cooler can service three retail routes.

Supplier: Barber-Colman Company, Rockford, Ill.

6831 on Reader Service Slip.

Brew house cleaning

"Specialized Detergents Mechanically Applied Speed Brew House Cleaning", a 4-page bulletin 79A, has been issued by Oakite Products, Inc.

Illustrated bulletin describes the cleaning of cereal and mash coolers, wort coolers, brew kettles, lauter tubs and brew lines. It tells how to remove stains and brighten copper and stainless steel equipment.

It also discusses equipment, both portable and permanently installed, which has enabled many breweries to make signifiicant economies. Materials designed for cleaning, mold control, bottle washing and conveyor chain lubrication are described as well.

6832 on Reader Service Slip.

See how PLEXIGLAS *"gives" under a blow . . . without breaking!*

Plexiglas

for protection and visibility in food processing

PLEXIGLAS® acrylic plastic reduces the danger of food contamination and production loss due to broken glass, when it is used as glazing for windows, partitions, skylights, and for lighting shields.

Contaminants can be kept out of machines, containers and conveyor systems . . . without sacrificing visibility . . . by using hoods, lids, covers and see-through sections of transparent, impact-resistant PLEXIGLAS.

The resistance of PLEXIGLAS to corrosion, weathering and breakage will help you keep maintenance costs to a minimum. Ease of installation and cleaning are other important advantages. PLEXIGLAS is available in crystal clear sheets and in transparent or translucent colors.

Look for the name of your nearest authorized dealer under PLEXIGLAS in the Plastics section of telephone directories in major cities.

Chemicals for Industry

ROHM & HAAS COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

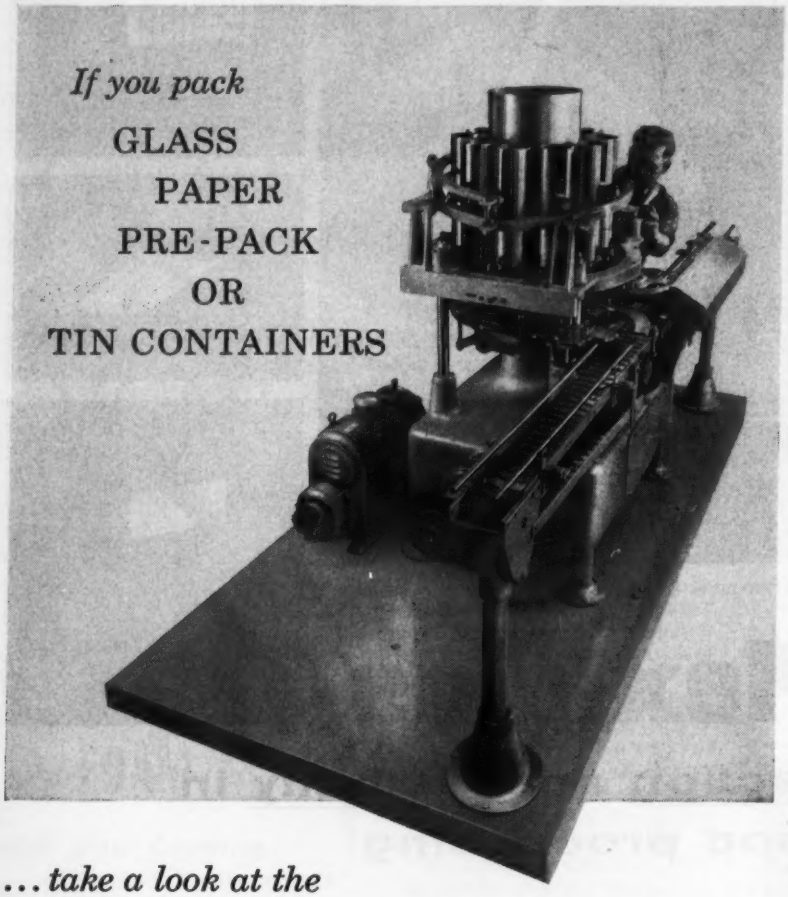
In Canada: *Rohm & Haas Company of Canada Ltd., West Hill, Ontario*

CALL YOUR AUTHORIZED PLEXIGLAS DEALER

PROMPT DELIVERY • TECHNICAL ADVICE • FULL RANGE OF SIZES AND COLORS

6833 on Reader Service Slip.

FLUIDICS* AT WORK



...take a look at the

NEW Pfaudler 10-station filler

With its *continuous through-feed* conveyor driven from the base of the filler, the new RP-210 is ideally suited for stand-up feed of glass, paper, or pre-pack containers.

With *standard can chute* or *infeed* conveyor, the new machine handles with ease conventional tin containers.

In this 10-station rotary piston filler you have a machine that can package products that range in consistency from evaporated milk to potted meat.

You can fill at rates up to 300 per minute (depending on container size and nature of product) with accuracy to ±1/10 fluid ounce.

Standard cylinders come in three diameters—1¾" for 1 to 8 oz. container size; 2¾" for 4 to 16 oz.; and 3¾" for 8 to 38 oz. You can also get a 3¾" diameter cylinder in special design for up to 46 oz.

The through-feed conveyor provides you with a 4 foot infeed and 4 foot discharge. Standard can chute or infeed conveyors of 6 to 8 feet in length are also available.

As with all Pfaudler fillers, you get "simplicity of design" in the RP-210—leading to quick, efficient operation, thorough cleaning, and very little down time.

For complete specs ask for Bulletin 979. Write to our Pfaudler Division, Dept. FP-110, Rochester 3, N. Y. Thank you.

*FLUIDICS is the Pfaudler Permutit program that integrates knowledge, equipment, and experience in solving problems involving fluids.

PFAUDLER PERMUTIT INC.
Specialists in FLUIDICS . . . the science of fluid processes

6834 on Reader Service Slip.

sanitation

Bakery sanitation manual

A 34-page "Bakery Sanitation Manual" covering sanitation practices required for all operations in a modern bakery has been issued by The Diversey Corporation.

Introductory section to manual contains a general discussion of why the bakery should be cleaned on a regular schedule, why more than one cleaner is necessary and lists specific cleaners for certain operations.

Illustrated manual also includes information on mould control, cleaning of bakery pans, general cleaning, insect control and a guide to the selection of chemical cleaning compounds.

Step-by-step instructions for all types of hand and machine cleaning are included.

6835 on Reader Service Slip.

Primer and finish paints for all needs

A complete line of protective and maintenance paints, enamels and coatings for use in food processing plants incorporate the latest developments in paint chemistry.

The line is made up of 20 primers and finish paints.

Primers include two rust-inhibitive primers for steel; a zinc-rich primer for cathodic protection against corrosion; a wood primer; a bituminous concrete primer; a metal passivator, used as a treatment prior to application of a primer on galvanized, metal, aluminum, bronze and copper surfaces; Tykor Tar Seal, a synthetic resin formula used to prevent bleeding of bituminous coatings through colored finished enamels; and Tykor Hydro-Kote, used as an exterior colorless water-repellent coating on brick, stucco and other masonry.

Finish coats are a heat-resistant, aluminum paint; an exterior paint; two Tykor Kora-Kote paints based upon chemical resistant chlorinated rubber resins, one for use on masonry, the other for use on machinery, equipment and

Tighten Down on FOAM

with Dow Corning Silicone Defoamers*

There's a *right* tool for every job. In foam control it's Dow Corning silicone antifoamers or defoamers . . . job-proved thousands of times over as the most efficient, most economical, and most versatile foam suppressors available.

*At prescribed levels, are sanctioned by FDA

FREE SAMPLE
and new manual on foam control

first in silicones
Dow Corning CORPORATION
MIDLAND, MICHIGAN

Dept. 3911a

Please rush a FREE SAMPLE of a Dow Corning silicone defoamer for my product or process, which is (indicate if food, aqueous, oil or other): _____

NAME _____

POSITION _____

COMPANY _____

ADDRESS _____

_____

6836 on Reader Service Slip.

piping; Tykor Tar Kote Regular, a highly-refined coal tar pitch enamel; Tykor Tar-Kote Thick, a heavy-body black asphaltic paint suitable for contact with potable water; and Tykor Hot Mastic, a black asphaltic material for hot application.

Also included in finish coats are Tyk or Korox, a high-gloss, chemically-resistant epoxy ester paint for interior equipment; Tykor Dari-Klad, a butidiene-styrene finish for use in areas subject to contamination by animal and vegetable fats and oils; Tykor Acrylite, a water-emulsion, flat acrylic coating for use on concrete, brick, plaster or wood structures; Tykor Bi-Korox, a two-component epoxy coating for use on steel and masonry surfaces where the highest degree of chemical resistance is required; and Tykor Alkyd Enamel, an exterior coating for tanks, etc., where a durable, high-gloss finish is desired, but chemical resistance is not important.

Supplier: Tykor Products, A Division of The Borden Company, 350 Madison Ave., New York 17, N.Y.

6837 on Reader Service Slip.

Chlorine disinfectant in tablet form

A disinfectant tablet that is completely and instantly soluble is described in one-page bulletin issued by First Spice Mixing Co., Inc.

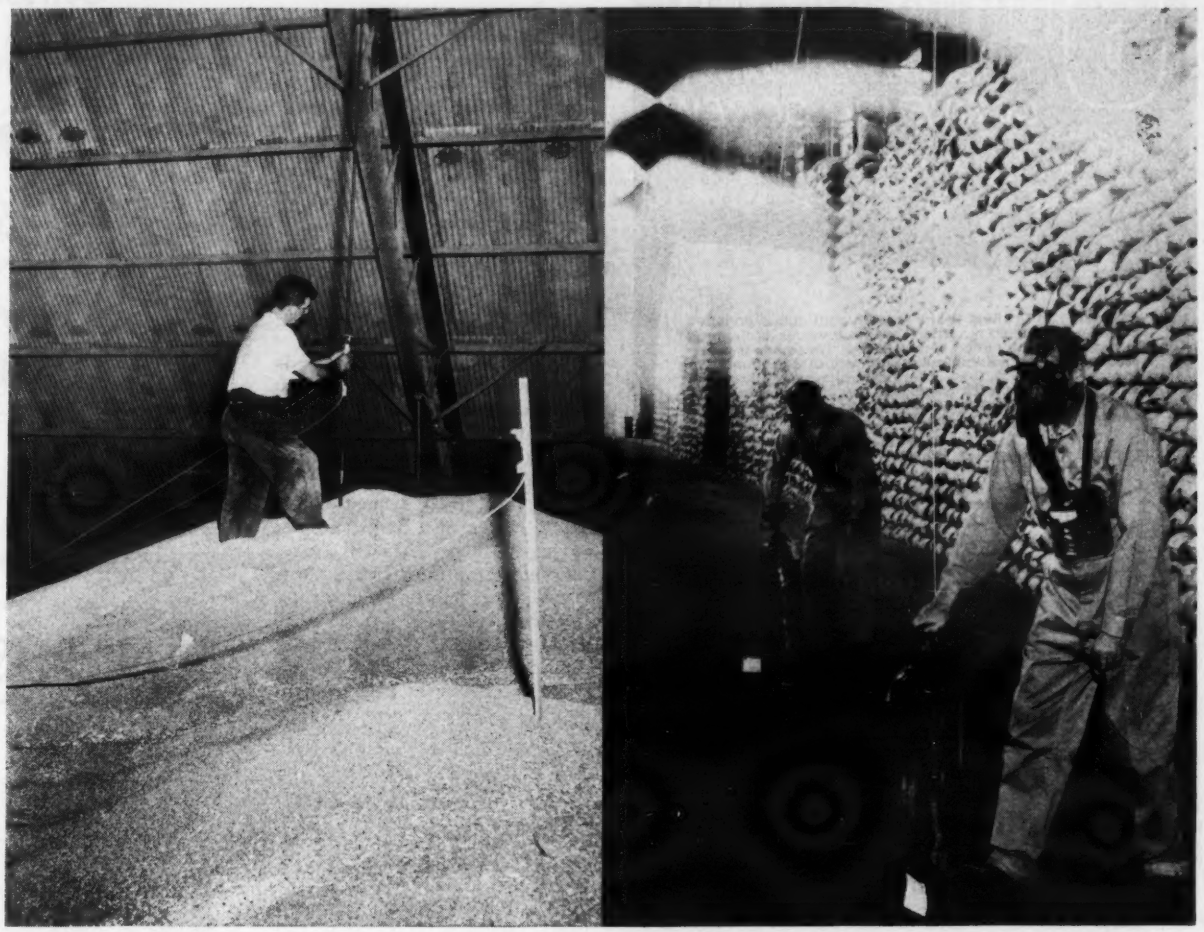
Each tablet, when dissolved in 1½ gallons of water, will give a solution of 650 ppm active chlorine. Tests in independent laboratories show maximum bacterial killing action on machines, walls, floors and sausage equipment.

The Meat Inspection Division of the USDA has granted approval for use of the tablets. Each tablet is uniform and pre-measured. They eliminate the use of liquids that will spill and skin irritating powders.

Tablets are packed in cans of 100 tablets each, 8 cans to the case. Each can is equivalent to 150 gallons of liquid.

6838 on Reader Service Slip.

DOW | FUMIGANTS



From storage bins to processing plants . . .

PROTECT STORED PRODUCTS WITH DOW FUMIGANTS

Whether you store bulk food, process it, or ship it, there's a Dow fumigant designed to protect your products from devouring or damaging attacks by over fifty different types of insects and rodents.

Use Dow Methyl Bromide for almost every method of fumigation – space, chamber, tarpaulin, boxcar or forced-air recirculation of bulk grains. Methyl Bromide quickly penetrates throughout all parts of the stored product; controls all forms of insects and rodents; and leaves no residual tastes or odors.

Use Profume® (98% methyl bromide, 2% chloropicrin) for the same applications, but where a slight warning odor is desired.

Use Picride® (80% methyl bromide, 20% chloropicrin by weight) in loosely constructed buildings where there might be a question of holding a lethal concentration of methyl bromide. Or if insects infest your processing machinery –a treatment with Dowfume® EB-15 will give a fast initial kill, and long-lasting residual control.

Used according to directions, Dow Fumigants will impart no residual odors or taste to grain or fully prepared commodities, they will not affect milling qualities, they present no appreciable fire risk . . . they are the most economical insurance you can have for protecting your investment in stored products.

Call your nearest Dow sales office for full information on the proper Dow Fumigant for your storage application. Or write: THE DOW CHEMICAL COMPANY, Agricultural Chemicals Sales Department 224BH11, Midland, Mich.

Products Advertised Herein Comply with U. S. Law
When used as directed on label and in accordance with good practice, they comply with the Food and Drug Law and other Federal Laws.

See "The Dow Hour of Great Mysteries" on TV.

THE DOW CHEMICAL COMPANY · MIDLAND, MICHIGAN

6839 on Reader Service Slip.

STAINLESS STEEL
Saniscrew
THE COMPLETELY SANITARY
CONVEYOR SCREW

Particles can't collect in the smooth continuous polished surface of Saniscrew...there are no crevices...cleaning is easy...maintenance is minimized. These are the reasons why many leading manufacturers of equipment for the processing of food, chemical, pharmaceutical and dairy products prefer Saniscrew as component equipment. If you use conveyor screws, and require completely sanitary handling, you should look into Saniscrew.

IN STOCK FOR IMMEDIATE DELIVERY: 4", 6", 9", 12" DIAMETERS

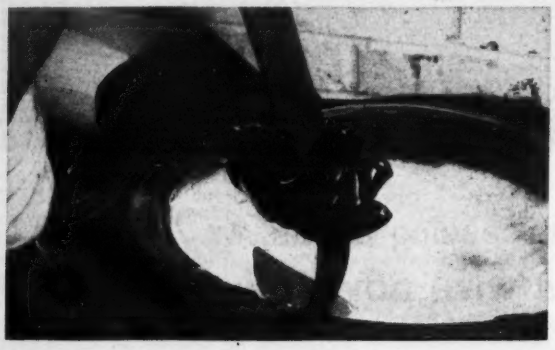
Where sanitary feature is not required, stainless screws to commercial standards are available for immediate delivery.

OTHER SIZES AND METALS TO YOUR SPECS

WRITE FOR BROCHURE

M-H STANDARD CORPORATION
515 COMMUNIPAW AVE., JERSEY CITY 4, N. J., HE 3-5834

6840 on Reader Service Slip.



EDMONT CASE No. 673: Handling caustic soda, $21 a dozen rubber gloves wore out in 5 shifts. Edmont recommended a gauntlet coated with reinforced neoprene (No. 922 Neox), which wore 20 shifts, reducing glove costs 83%.

Outwear rubber gloves 4 to 1

In the case above, the *job-fitted* glove reduced glove costs from 4½¢ per man-hour to ¾¢. Its reinforced neoprene coating gives best all-around resistance to caustics, chemicals, snags and abrasion. *Extra*coat on palm and fingers wears 20% longer; normal coating on back retains full flexibility. Wing thumb and curved preflexed fingers improve fit and grip.

Free Test Offer to Listed Firms: Tell us your operation. From more than 50 types, we will recommend correct *Extra*coated gloves and send samples for on-the-job testing.

Edmont Inc., 1212 Walnut Street, Coshocton, Ohio. In Canada, write Edmont Canada Ltd., Cowansville, Quebec.

Edmont
JOB-FITTED GLOVES

6841 on Reader Service Slip.

sanitation

Sanitary inspection checklist available

"Sanitation Inspection Checklist for Edibles Processors" list 16 important areas of maintenance activity to help management and maintenance personnel set up the safest, most efficient housekeeping procedures.

Data sheet SD 909-A lists such potential trouble spots as food storage areas, washing and sterilizing facilities, garbage receptacles, etc.

Under each of these headings are mentioned the most pertinent factors of proper sanitation. For example, under the category of lighting and ventilation, the checklist calls for the inspection of fans, hoods and ducts; stoves, ovens, etc.; exhaust fans; skylights; and lighting and ventilation and temperature control facilities.

List was compiled by the Puritan Chemical Company.

6842 on Reader Service Slip.

Quick-connect, disconnect coupling for permanent piping applications

A quick-connect, disconnect coupling has been designed for permanent piping applications.

Known as the Rigid-Line Series. no flexible hose is

Quick-connect, disconnect coupling is demonstrated used in pairs in above photo

required on either end of the coupling which seals tight on the user's choice of rubber gasket.

Used in pairs, it is ideal for quick addition or removal of relief, flow control or check valves, gages, pumps or meters in permanent pneumatic

Specify this better
Corrosion-Resistant Mortar

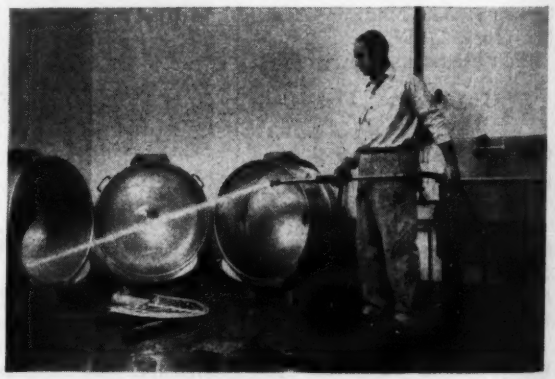
for Floors, Sewers, Processing Vessels, Chimneys and other Masonry Installations

Sauereisen Resin Cement No. 40 has excellent adhesion to acid brick and tile, withstanding acids, alkalies, foods, oils, water and steam. Ask for Data Sheets.

Sauereisen Cements Co., Pittsburgh 15, Pa.

SAUEREISEN RESIN CEMENT No. 40

6843 on Reader Service Slip.



CLEAN, SANITIZE, SCRUB EQUIPMENT with jet stream that gets government inspection approval

Only Sellers Jets give the cleaning power needed—fastest, surest cleaning tool in the food industry! Use only your own plant steam and water—let Sellers produce scalding hot water (up to 210°F) in a solid jet stream that literally rips off stubborn grease, sticky film, food residues. Sanitizes as it cleans! Results approved by Government inspection! One demonstration proves why the Sellers Jet is unequalled in the food industry . . . slashing cleaning time and costs as dramatically as it whips through clean-up work. Pays for itself in savings in first few weeks alone. Steps up efficiency, workers love to use it. Get complete details in our Catalog 424B. Send for your copy today.

SELLERS *Injector* CORPORATION
1601-N Hamilton St., Philadelphia 30, Pennsylvania • Since 1848

6844 on Reader Service Slip.

hydraulic or other fluid flow lines.

Flow through the coupling assembly is through straight pipe which can be easily cleaned, making the coupling ideal also for perishable fluid applications.

Coupling is available in ½" and 1" ID sizes with a choice of three metals; cadmium plated steel, anodized aluminum or Type 316 stainless steel, passivated.

End fitting choices for the 1" size include 1" male and female pipe thread; ¾" male and female pipe thread; or ¾", 13/16", ⅞", 15/16", 1", 1⅛", 1 3/16" and 1¼" tube for brazing or welding.

End fitting choices for the ½" size include ½" male pipe thread; ⅜" male and female pipe thread; ¼" male and female pipe thread; or 11/16", ⅝", ½", 7/16", ⅜" and 5/16" tube for brazing or welding.

Supplier: Snap-Tite, Inc., Union City, Pa.

6845 on Reader Service Slip.

Strong, fast-setting anchoring compound

A pourable cement, called Evr-Tite, used as a fast-setting grout for machinery and equipment bases, produces a hard, tough base in only a few hours. Equipment can be relocated and put back into operation the same day.

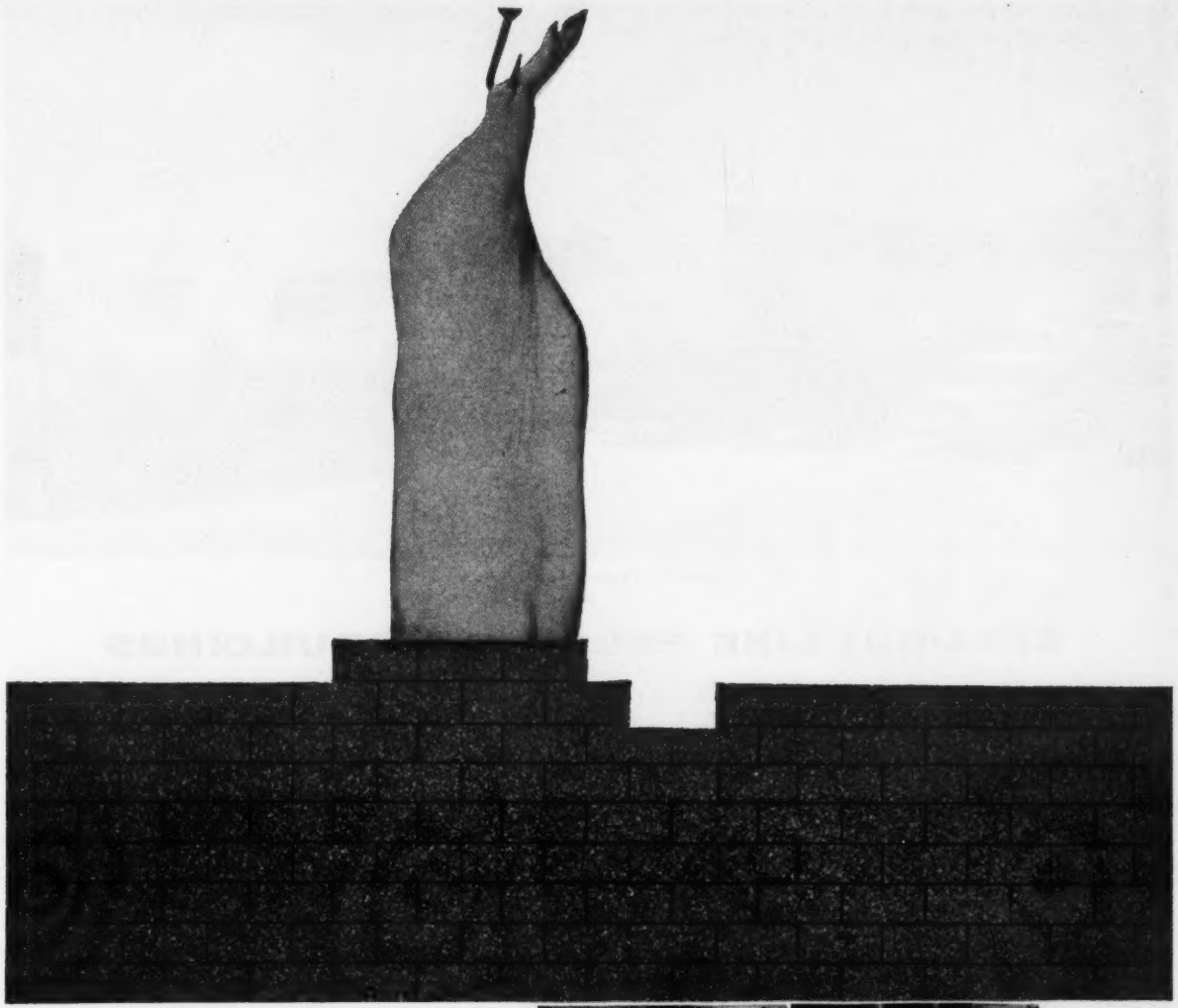
It also has application in the positioning and setting of anchor bolts, fastening pipe flanges, hand rails, partitions, stanchions, conveyors, etc.

It bonds readily to existing materials and withstands maximum impact, compression, tensile and sheer strengths.

Compound is a finely divided powder, containing expansion controlling, water-erosion resistant additives. There is absolutely no shrinkage in the compound while setting. It is odorless, vibration resistant and self-leveling.

Supplier: The Monroe Company, Inc., 10703 Quebec Ave., Cleveland 6, Ohio.

6846 on Reader Service Slip.



FOAMGLAS® works for ECKRICH MEATS

EVIDENCE: Back in 1952, Peter Eckrich & Sons, Inc., Ft. Wayne meat specialty manufacturers, picked FOAMGLAS to form insulation envelopes around six coolers. They wanted to insure constant temperature and humidity control while providing extra structural benefits beneath the wearing floors. Their report: eight years of reliable temperature control with no noticeable increase in refrigeration load; full humidity control *without separate vapor seals*. FOAMGLAS forms a natural vapor barrier; sufficient compressive strength in FOAMGLAS floor insulation to withstand constant heavy equipment and traffic loads; no loss of insulation performance.

New installations for Eckrich have just recently been completed . . . all insulated with FOAMGLAS.

For the full story on this installation, write for a copy of our Eckrich Case Study Report and our Low Temperature Insulation Catalog. Pittsburgh Corning Corp., Dept. FP-110. One Gateway Center, Pittsburgh 22, Pa.

Pittsburgh Corning makes available a complete line of insulation accessories for use with FOAMGLAS.

PITTSBURGH PC CORNING

6847 on Reader Service Slip.

Pepsi Cola Company, Havana, Illinois

STRAIGHT LINE PRODUCTION BUILDINGS

. . . Built to work . . . designed to please

Dr. Pepper Company, Columbus, Ga.

Interior, Pepsi Cola Company, Havana, Illinois

Nothing impedes the straight line flow from receiving to filling, capping to shipping in these handsome, efficient bottling plants built by Butler. The reason is simple. . . rigid frame, clear-span construction provides a post-free interior with complete freedom of inside planning, placement of equipment, maneuvering of materials and stacking of cases. The unobstructed interior lets you place conveyor systems anywhere within the structure. And, since the entire roof load is supported by the rigid frames, you can locate overhead doors anywhere for easy loading and unloading.

Whatever you bottle, pack, store or ship, a Butler pre-engineered building will help you build profits. As a plus, you can choose from two superior curtain wall systems, Monopanl® or Butlerib®, in beautiful and protective Butler-Tone™ colors that let you create a building design that wins immediate community acceptance. You select from the widest range of clear span sizes and designs . . . and only with Butler pre-engineered buildings can an optional 20-year roof guarantee be offered. Mass production economies, and exceptional speed of construction complete the picture.

For full details, call your Butler Builder today. . . he's a skilled member of the most experienced Builder organization in the industry. Ask him about financing, too. You'll find him listed in the "Yellow Pages" under "Buildings" or "Steel Buildings."

"See Sweet's Industrial Construction File—Section 8-B" MBMA METAL BUILDING MANUFACTURERS ASSOCIATION

CELEBRATING 60 YEARS BUTLER FABRICATING METALS

BUTLER MANUFACTURING COMPANY

7479 EAST 13th STREET, KANSAS CITY 26, MISSOURI

Manufacturers of Metal Buildings • Plastic Panels • Equipment for Farming, Transportation, Bulk Storage, Outdoor Advertising • Contract Manufacturing
Sales offices in Los Angeles and Richmond, Calif. • Houston, Tex. • Birmingham, Ala. • Kansas City, Mo. • Minneapolis, Minn. • Chicago, Ill. • Detroit, Mich. • Cleveland, Ohio • New York City and Syracuse, N.Y. • Washington, D.C. • Burlington, Ontario, Canada

6848 on Reader Service Slip.

Preparing concrete floors for protective coating

Complete details of the proper repair and preparation of concrete floors prior to application of organic protective coatings is subject of 10-page bulletin 1019.

Bulletin, released by Carboline Company, includes a chart, listing nine separate conditions or states of concrete floors commonly found in various plants. After each condition, recommended repair method is explained in detail.

Repair of concrete cracks and expansion joints is shown in diagrams. Procedure for determining pH of concrete is also explained.

6849 on Reader Service Slip.

Motor selection guide from ¼ to 200 hp

Comprehensive catalog, No. 200, issued by Sterling Electric Motors, Inc., provides complete data on line of Sterling AC Multi-Shielded motors ranging from ¼ to 200 hp.

Illustrated, 56-page catalog includes complete pricing and dimensional data on motors of this type. Information is also given for various modifications such as specialized mountings and enclosures and Multi-Shielded drip-proof motors.

A special section in the catalog deals with selection of motors for specific applications.

6850 on Reader Service Slip.

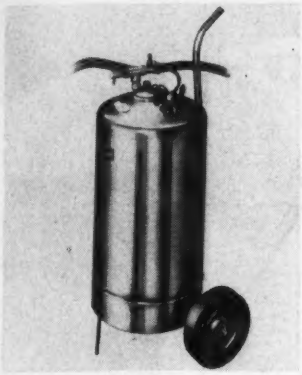
Saves up to 50% on cleaning time, labor

A large model of a stainless steel "Du-Zolver" apparatus for spraying cleaning solutions onto equipment, walls, floors and difficult to clean areas in food industry plants, provides a savings of up to 50 per cent on cleaning time and labor.

Unit holds and mixes 10 gallons of detergent at predetermined concentration into

hot water pressure lines, producing up to 1600 gallons of cleaning solution.

Solution can be sprayed over an area up to 20 per cent



Apparatus for spraying cleaning solutions has wheels and a handle so that it can be wheeled into any area where workmen walk

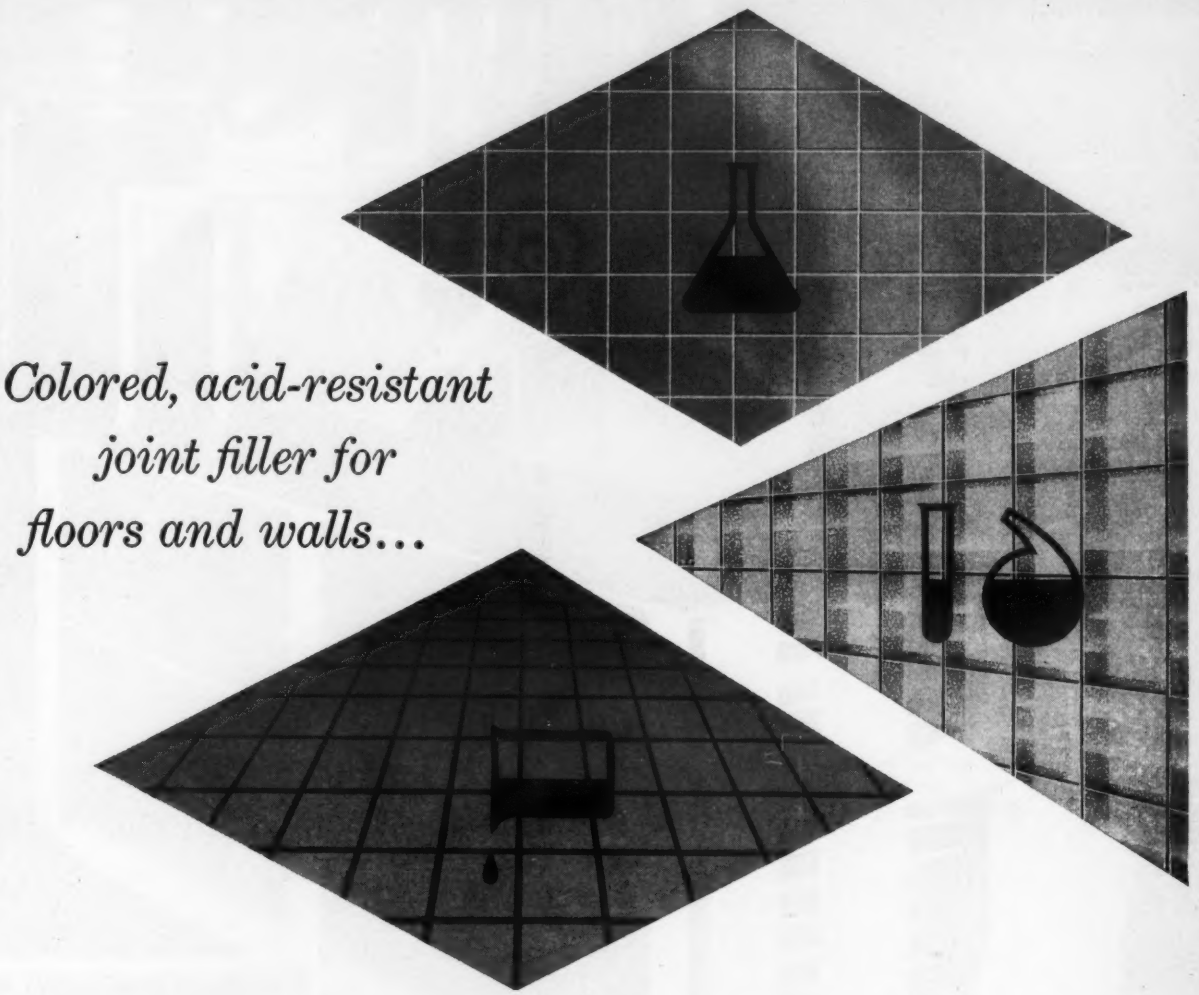
greater than old-style cleaning guns and sprayers have produced.

A 3-gallon model is also available. This unit has a handle for ease of handling and contains the same safety features as the larger model.

Supplier: Du Bois Chemicals, Inc., 1120-40 W. Front St., Cincinnati, Ohio.

6851 on Reader Service Slip.

"See what happens when I press this lever!"



Colored, acid-resistant joint filler for floors and walls...

Supertite GROUT CEMENT

Supertite Grout Cement is a mortar type acid-alkali resistant grout cement that literally welds brick, tile or glass block together, resulting in a perfect, permanent floor or wall.

Supertite is immune to attack by food acids and will easily withstand cleaning solutions, organic chemicals and water. It is easily cleaned and sanitary and will not deteriorate with age. Supertite is permanent as the tile itself.

Supertite is an ideal cement for both new and old jobs because it sets quickly and bonds permanently, yet cleans easily before setting... will not discolor or damage tile.

Add years of service to walls and floors and eliminate contamination problems with Supertite ...available in three attractive colors.

For information write:

Nukem

NUKEM PRODUCTS CORP.
Dept. 4K • 4809 Firestone Boulevard • South Gate, Calif.
A Subsidiary of Amercoat Corp.

N101

6852 on Reader Service Slip.

Food Machinery & Chemical Corporation's test facilities feature a commercial-size unit. To left of drying chamber are preparation area and 20 F loading room, also a zero degree holding room; doorway at right leads to unloading and packaging room kept at 20 per cent relative humidity.

Mobile shelf car, on which product trays are loaded, is guided by rails. Compact layout is achieved by use of turntable.

View at right shows operator disconnecting one of the two quick-disconnect hydraulic couplings through which glycol is circulated. Note condenser plates located on both sides of shelf car.

Freeze drying equipment roundup

- test facilities available to processors . . .
- suppliers of equipment . . .

FRANK L. BONEM
Associate Editor

Over 50 items have been processed at Stokes test facility which was set up by the late Dr. E. W. Flosdorf, pioneer of freeze drying. Operator is shown setting up test on steaks

INFORMATION in this roundup was obtained from equipment manufacturers present at the recent Military-Industry Conference on Freeze Drying sponsored by the Research Development Associates Food and Container Institute for the Armed Forces.

A report on present status of freeze drying is presented in the article beginning on page 28.

An important part of any freeze drying system is the method used for removing moisture. If vacuum is obtained by steam ejectors, moisture is removed and condensed in steam jet system.

If mechanical pumps are used, provision must be made for condensi..g (freezing) moisture out ahead of vacuum pump system.

In general, factors that determine which system be used are: availability of water, availability of steam, electrical power costs, size of freeze drying equipment, and frequency or length of runs.

Test Facilities*

American Sterilizer Company is offering a study program through which food processors can submit samples to firm's laboratory for determination of freeze drying cycles.

Food Machinery and Chemical Corporation, Central Engineering Laboratories, has freeze drying production facilities — see photos opposite page — which food processors can use to evaluate freeze drying process. Cost studies thus obtained will be based on actual production runs; 1500 lbs of frozen foods can be handled per batch.

This facility is fairly solidly booked through 1960. At present it is being used to freeze dry large production order of California asparagus for Puccinelli Packing Company of Turlock, Calif.

A second test unit has been planned, and should become available for use by food processors in early 1961. (Detailed description of this production-scale unit will be found in the next section on equipment under the FMC listing.)

NRC Equipment Corporation is making available laboratory pilot-scale facilities for measuring process variables and for obtaining technical data from which design criteria can be established.

Equipment available for testing includes rotary, shelf and belt driers; rotary scraped refrigerated condensers, static condensers, mechanical pumps, and steam ejectors; various types of heat exchangers and instrumentation for measuring process variables as well as changes in the food products.

F. J. Stokes Corporation also has invited food processors to make use of their laboratory's comprehensive facilities for process evaluation or for freeze drying small quantities, see photo and caption above.

Equipment Suppliers

Domestic

American Sterilizer Company, 2400 W. 23rd St., Erie, Pa., manufactures freeze drying equipment that ranges from pilot-plant to production units.

One model in the pilot-plant series is a packaged, mobile unit that requires only one electrical plug-in connection.

6853 on Reader Service Slip.

Chain Belt Company, 4701 W. Greenfield Ave., Milwaukee, Wis., manufactures drying equipment which thus far has been applied to drying of fruit juices and tea at high vacuum — same range of vacuum as used for freeze drying. Company proposes to adapt this equipment to continuous freeze drying.

More detailed information on this continuous dryer in the next issue.

6854 on Reader Service Slip.

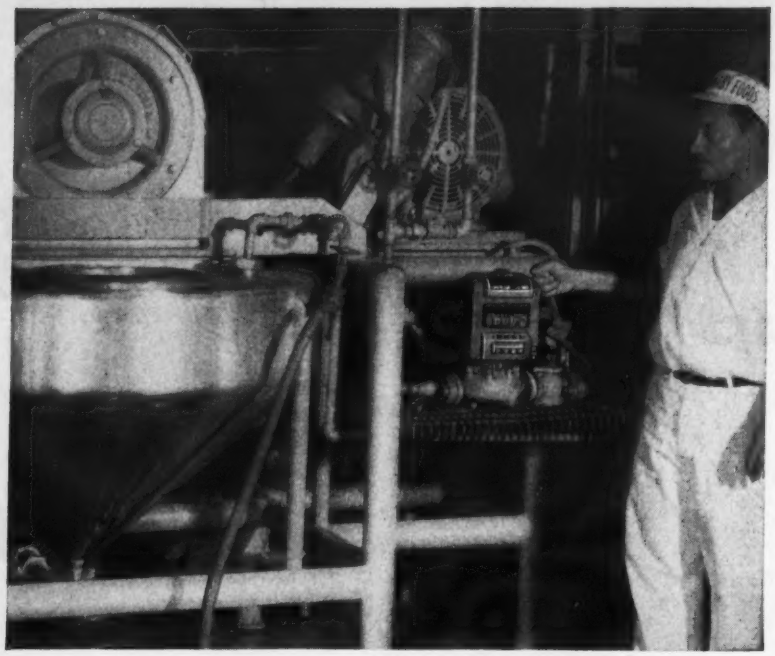
Food Machinery and Chemical Corporation, Central Engineering Laboratories, San Jose, Calif., has developed a commercial-size freeze drying plant which is also being offered as a test facility. See preceding section.

Feature of this unit is a mobile rail car which provides 500 sq ft of heated shelving for 84 aluminum trays. These trays can be loaded to a depth of 1 to 1½ inches or from 1½ to 3 lb/sq ft.

Mobilizing the "hot-shelf bundle" on a rail car makes possible easy and rapid transfer of frozen product into the freeze drying chamber, and of the freeze dried product to the packaging room. This feature also facilitates the engineering and layout of a larger production operation, made up of a number of the freeze drying chambers.

Latent heat required for vaporization of the frozen moisture is supplied by circu-

*For addresses of companies, see next section



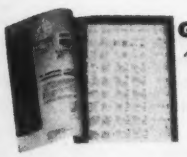
Accurate Neptune Meters add "FINISHING TOUCH" to Gerber Baby Foods

Precise volumetric control in finishing canned foods is a common problem. Gerber Products Company set about solving it with all the meticulousness they could muster for their sensitive baby market. Formerly they carefully weighed all ingredients of the batch, then introduced water manually up to a mark in the cone tank. Occasional human errors were costly.

Cure was to install two Neptune hot water meters with Auto-Stop quantity control. The operator simply pushes buttons to set the quantity required by the formula, and opens the valve. The meter shuts off automatically . . . delivers the exact quantity every time.

In another department Gerber uses Neptunes for accurate batching of liquid sugar and water. Improves quality control, reduces traffic on the mixing platform, saves time, and improves housekeeping.

You, too, can improve quality, and save time and materials with Neptune liquid meters.



GET THE FACTS
Ask for helpful Meter Data Bulletin 566 KFP See Neptune Data Pages in Chemical Engineering Catalog.

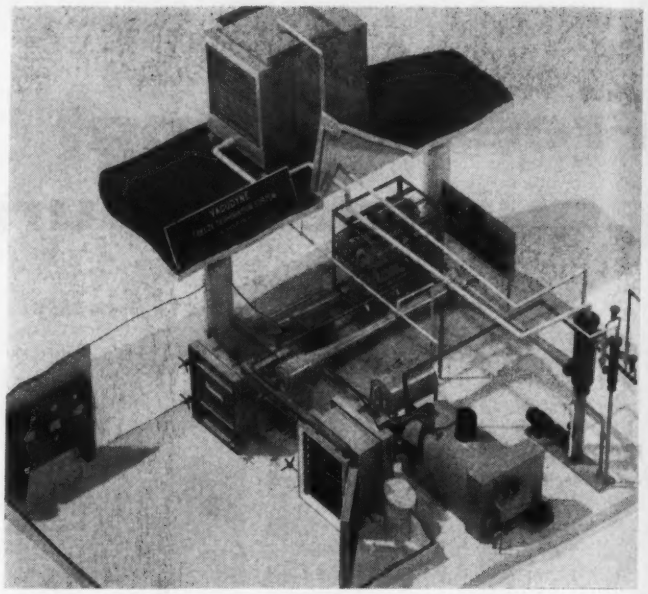
neptune

NEPTUNE METER COMPANY
LIQUID METER DIVISION
47-25 34th St., Long Island City 1, N.Y.

Branches in:
ATLANTA • BOSTON
CHICAGO • DALLAS • DENVER
LONG ISLAND CITY
LOS ANGELES • LOUISVILLE
PORTLAND, ORE.
NO. KANSAS CITY, MO.
PHILADELPHIA (Bala Cynwyd)
SAN FRANCISCO (Millbrae)
Canada: Neptune Meters, Ltd.,
TORONTO 14, ONTARIO

6855 on Reader Service Slip.

Freeze drying roundup continued



Model of freeze dryer Vacudyne installed at the Quartermaster Food & Container Institute for the Armed Forces.

Vacuum chambers are 4 ft by 4 ft and 5 ft 9 in high on inside, and have a capacity of 300 lb of meat. Each chamber has eight plates whose temperature can be varied from −20 to 300 F. Design capacity of system is 50 lbs moisture removed per hour from each chamber at 750 microns (0.75 mm). Complete installation, including 4-stage steam ejector system and boiler, cost approximately $50,000 (government contract).

lating glycol solution through the shelves of the rail car. Trays can be heated either by contact with the shelf or by infrared radiation.

Drying capacity is 100 lbs per hour of moisture evaporated from the product.

Mechanical vacuum pumps reduce pressure in freeze-drying chamber to 100 microns in 15 minutes. (This plant can also be equipped with steam jets.)

Moisture is removed from the system by condensation on refrigerated plates maintained at −40 to −50 F, immediately adjacent to the heated shelves as shown in the photos on page 72. This unique design results in a very short, open, line of travel of the vapors from the product. Hot gas defrosting at the end of the drying cycle minimizes down time.

6856 on Reader Service Slip.

NRC Equipment Corporation, 160 Charlmont St., Newton Highlands, Mass., offers technical engineering service for design of production equipment on a project basis, based on their years of experience in the high vacuum field.

6857 on Reader Service Slip.

F. J. Stokes Company, 5500 Tabor Road, Philadelphia 20, Pa., offers a standard line of freeze drying cabinets which are modified as required.

Standard size of the shelves is 60 by 44 in., and they have an average loading capacity of 3 lb/sq ft. Number of shelves per cabinet ranges from about 10 to 17. (See cover and page 29 for photos of equipment.)

Shelves can be heated by circulating hot water (175 F), steam, oil, or other heat-exchange fluids. Systems for pulling vacuum may consist of steam ejectors or mechanical vacuum pumps with mechanical refrigeration.

"Packaged" production or pilot-plant units, having 200 lb capacity, are priced from $5000 to $35,000.

Multi-chamber production systems now installed or about to be installed range from $100,000 upwards of $300,000.

Stokes has designed and engineered complete plans and floor layouts for a range of production-scale freeze drying systems through which five to ten tons of food per hour can be processed.

6858 on Reader Service Slip.

Vacudyne Corporation, 14419 S. Torrence Ave., Chicago 33, Ill., designs and builds freeze drying equipment to suit specific installations; does not stock or manufacture any specific items of machinery.

Firm supplied equipment for the two-chamber installation used by QM Food and Container Institute in its research, see illustration facing page.

6859 on Reader Service Slip.

Equipment Suppliers

Foreign

A/S Atlas, Baldersgade 3, Copenhagen N., Denmark, features accelerated freeze drying. Heat transfer, which generally is limiting factor to faster freeze drying, is improved by forcing heated plates in to better contact with product through hydraulic pressure.

Pressure is applied gradually from 0 to 8-10 psi as drying cycle progresses. Springs compensate for unevenness in layers.

To facilitate escape of vapors from surface of foods, layers of expanded metal are inserted between material to be dried, and upper and lower plates.

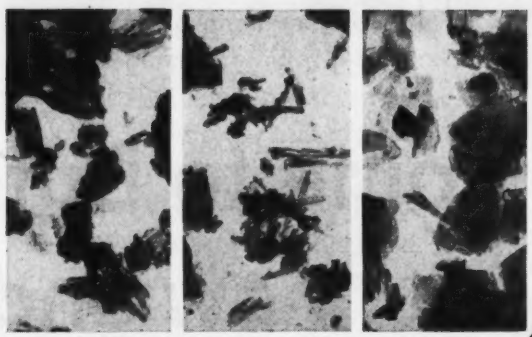
Use of pressure when freeze drying 1-in. thick fish fillets has reduced drying time from 16-20 hours to about 8 hours.

In general, vacuum chambers are cylindrical in shape and have 18 stainless steel heating plates which provide about 250 sq ft of drying surface. Plates have space for two aluminum trays, each tray normally holding about 20 lb product.

Plates are heated by circulating water under pressure. At start, water is cold. As cycle progresses, its tempera-

Electron micrographs of Micro-Cel A, C and E show particle structures ideal for food applications.

1μ



Micro-Cel helps keep food mixes bone dry!

Micro-Cel®, Johns-Manville's new synthetic calcium silicates, answers caking problems. Highly absorbent, it remains a free-flowing powder after absorbing triple its weight. High bulk (4½ lbs. to a cu. ft.), irregular particle shape and high surface area, make it ideal for coating sticky and hygroscopic particles. Micro-Cel gives low cost per pound-volume. To keep food mixes free-flowing, even under the worst conditions, try Micro-Cel. For information, samples and assistance, mail coupon below!

JOHNS-MANVILLE
Celite Division

1960

JOHNS-MANVILLE, Box 14, New York 16, N. Y.
In Canada: Port Credit, Ontario.

☐ Please send additional data.

☐ Please send free sample of suitable grade of Micro-Cel for use in:_____

☐ Have local Sales Engineer contact me.

Name_____ Position_____

Company_____

Address_____

City_____ Zone____ County_____ State____

Celite Division synthetic silicates used as anti-caking agents up to 2% are not considered food additives as defined by FD&C Act Amended, Section 201(s).

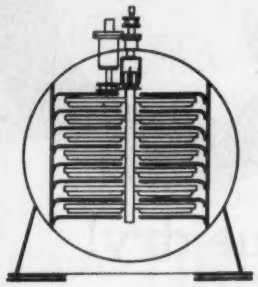
6860 on Reader Service Slip.

ture is raised up to 280 F, then gradually cut back to 140 F.

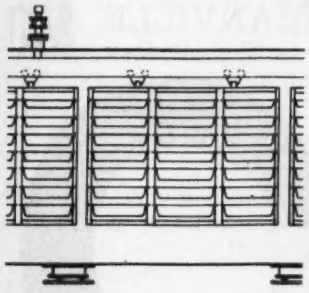
Feature of the vacuum system is the sizing of two steam ejectors, one has twice the capacity of the other — to meet varying requirements of the drying cycle.

This enables steam jet system to operate at full capacity — both jets on — or at 2/3 or 1/3 capacity — one jet off — with corresponding economy in steam and water consumption.

Equipment consisting of four chambers has a capacity of ap-



Cross-section of Leybold's continuous freeze dryer, now under construction in Germany, has carriers conveyed from an overhead rail traveling through tunnel sections. Carriers have space for 42 trays; can be automatically loaded and unloaded



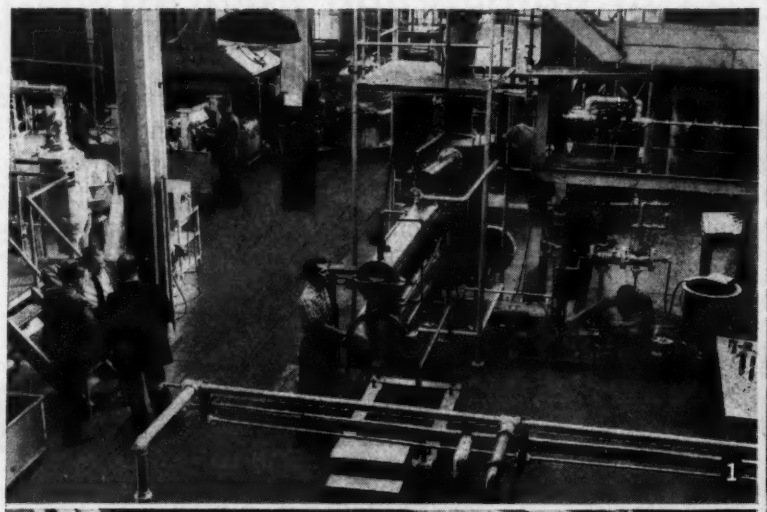
proximately 4 tons per 24 hours and is priced at about $175,000, f.o.b. North European port.

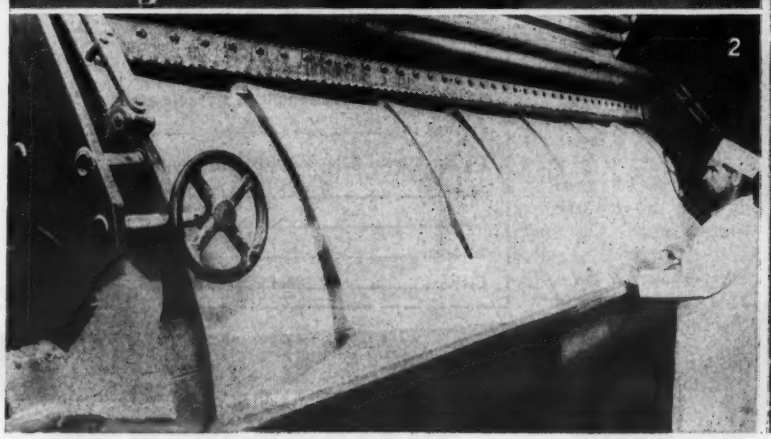
The three units being used by Armour & Co., one in Aberdeen, Scotland, and two in Bellwood, Ill., were furnished by A/S Atlas.

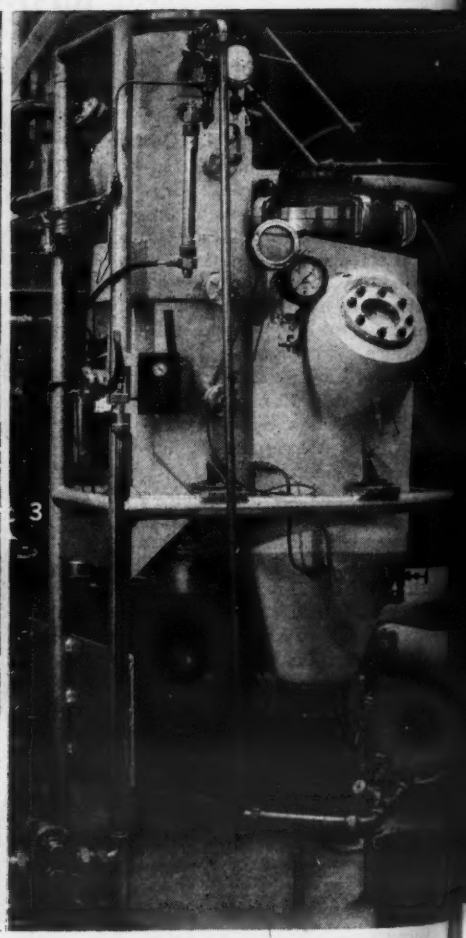
Leybold-Hockvakuum-Anlagen, G.M.B.H., Bonner Strasse 504, Koln-Bayental, Germany, has developed equipment for freeze drying on a continuous basis.

Vacuum chambers are cylindrical tunnels, assembled end to end, through which 20

Key food processors come to Buflovak to develop new and better products at lower cost







by 20 in. food trays are conveyed on carriers, see illustrations on preceding page. Two airlocks are provided for entrance and exit of the carriers.

Two of these tunnel sections comprise a large pilot-plant or small production installation and additional sections can be added as production requirements increase.

Loading surface of each carrier is about 108 sq ft and capacity of each tunnel section ranges from about 1.65 tons up to 4.41 tons per 24 hours.

Heating of carrier plates is controlled by "barometric measurement of temperature."

Approximate price of equipment ranges upward from $80,000.

Vickers-Armstrongs, Ltd., South Marton Works, Swindon, Wiltshire, England, is currently manufacturing equipment for batch processing. However, it is also developing equipment for continuous processing.

This system features improved control of the heated plates with the product being markedly faster freeze dried. A hydraulic system exerts up to 8 psi on these plates which are free to move in a vertical direction.

Expanded metal inserts between the frozen product and the plates help provide vapor release paths.

Vacuum chambers have a capacity of up to 1¼ tons (wet) per 24 hours and have 16 plates (15 shelves) which provide a total area of 353 sq ft.

Plates, which are about 6 ft by 1 ft-11½ in., are heated by hot water circulating at 80 gpm under 60 psi.

Generally, four vacuum cabinets will freeze dry approximately five tons (wet) of fruits and vegetables per 24 hours (three 8-hr shifts). END

More and more of today's progressive food processors explore new products and processes with Buflovak's experienced engineers. **Research** often starts in the Buflovak Customer Technical Service Laboratory—a completely equipped research center for investigating evaporation, drying, solvent recovery, cooling, and other processes. Here you can test by the beakerful or run carload lots on a round-the-clock production scale. **Engineering** experts work with test results or your known specifications . . . impartially select the right units from Buflovak's complete line of food processing equipment. Whenever custom units are preferable, they use their design know-how and production facilities to follow through. **Service** from Buflovak includes realistic deliveries and continuing customer service to keep your operation humming, your profits climbing. Write for Catalog 392 or see our insert in Chemical Engineering Catalog. Buflovak Equipment Division, 1559 Fillmore Avenue, Buffalo 11, New York.

Buflovak Equipment Division

BLAW-KNOX

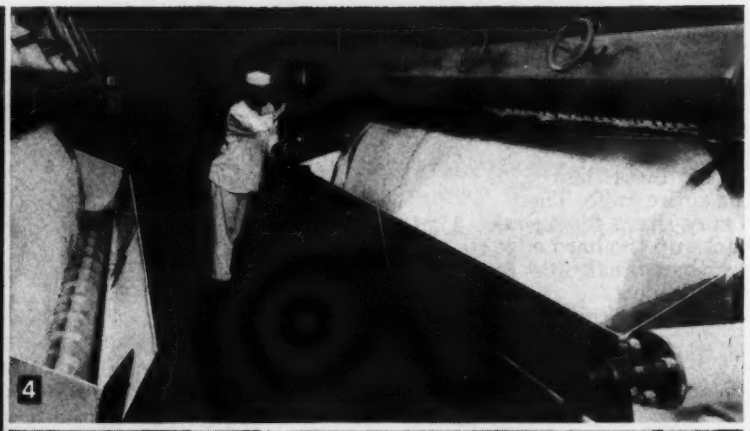
1 **Customer Technical Service Laboratory** is a completely equipped research center where you can test new products, examine process efficiency, and explore by-product possibilities for extra profits.

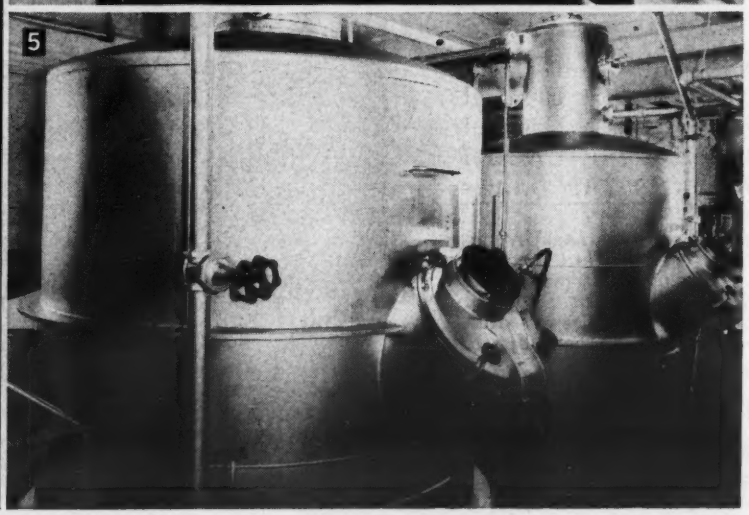
2 **Potato flakes** are economically produced on this 5-ft. by 16-ft. dryer designed and built by Buflovak.

3 **New Agitated Film Roto-Vak** provides high heat transfer and a processing time of only seconds . . . now permits concentration of viscous, foamy, salting and extremely heat-sensitive products never before successfully concentrated.

4 **Flaked cereals** are mass produced on four double drum dryers operating three shifts a day for a six-day week.

5 **Tomato paste production** was increased 100% with the installation of a Buflovak triple effect evaporator.





6861 on Reader Service Slip.

Special opportunities for you in the Classified Advertising section, page 130

This is a Knife

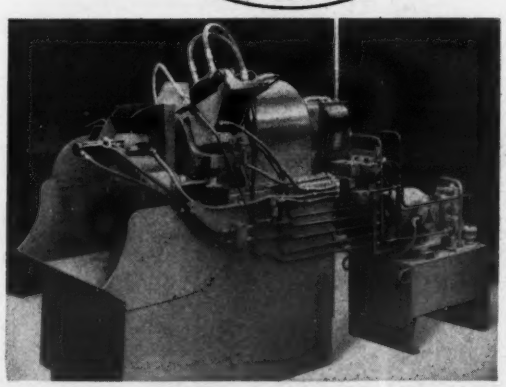
. . . it was *designed* by Urschel
. . . it was *engineered* by Urschel
. . . it was *manufactured* by Urschel
for an *Urschel machine*

Closeup of specially treated Urschel knife edge

It is the most important part of the machine because it cuts the product. The thickness of this knife is controlled to less than one ten-thousandth of an inch. Knives of such accuracy have *never* been made by others. This accuracy makes it possible to stack many knives on a knife spindle with such precision that knives can be replaced without adjustment and without having the knife rub against mating parts. This accuracy helps to reduce maintenance to a minimum.
Induction heating is used to harden only the edge of the knife to a greater hardness than would be practical to harden the entire knife. The hard edge causes the knife to stay sharp for an extended period. Soft material backs up the hard edge so that the knife will bend rather than break into fragments if the knife strikes a foreign object.
The selection of stainless steel in this knife and its treatment is based upon many years of metallurgical experience in the testing of stainless steels for the cutting of food products.

This is a Machine

. . . it was *designed* by Urschel
. . . it was *engineered* by Urschel
. . . it was *manufactured* by Urschel
for the *making of Urschel knives*



This is only one of many machines made in the Urschel shops for the manufacturing of knives. Standard machine tools cannot be purchased for the economical making of Urschel knives for the required rigid specifications. Research is continuously carried on at Urschel Laboratories in search of better methods and better materials for the manufacture of knives.

PRECISION HIGH-SPEED FOOD CUTTING EQUIPMENT

URSCHEL LABORATORIES INC.
VALPARAISO, INDIANA

Designers and manufacturers of precision, high speed cutting equipment for food products.

6862 on Reader Service Slip.

Line of bakery mixers from 10 to 140 quarts

Eight mixers, five floor units and three table models, are described and illustrated in 18-page fold-out pamphlet. Floor models have capacities of 140, 80, 60 and 30 quarts; bench models have capacities of 20, 12 and 10 quarts.

Available from The Hobart Manufacturing Company, 3½ by 6½ in. pamphlet also discusses and presents illustrations of three food scales.

Attachments for chopping, grinding, slicing, shredding and grating, and representative group of beaters, whips and dough arms are pictured.

6863 on Reader Service Slip.

Redesigns lines of propeller mixers

Two four-page bulletins available from Mixing Equipment Co., Inc., describe new designs of propeller-type mixers.

Bulletin B-520 presents portable line; bulletin B-521 presents fixed-mounting line. Both catalogs contain break-away drawings illustrating gear drives and other mechanical highlights of design.

Various features of the Lightnin Mixers are discussed, and dimensions and specifications are tabulated in each of the publications.

6864 on Reader Service Slip.

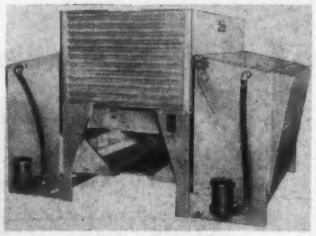
Boosts condenser capacity for peak loads

Dual spray units, which reduce dry bulb temperature, are attachable to each side of main condenser. Automatic controls actuate the spray precoolers when ambient dry bulb temperatures reach predetermined level.

Utilization of pre-coolers is practical in areas which have extremely high peak temperatures. By use of spray units, selection of main condenser can be based on lower design temperature.

Pre-coolers, condensers and

control system are described and illustrated in six-page Bulletin DCR-60, available



Air-cooled condenser is in center. Spray units with recirculating pump are on each side

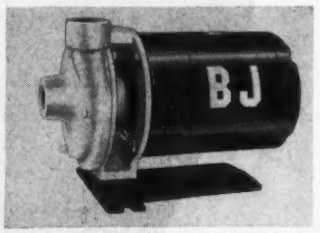
from The Marley Company. Publication discusses specifications and tabulates dimensions and capacities of condensers.

6866 on Reader Service Slip.

Mount pump at any angle

Uses: For wide variety of general purpose pumping applications.

Features: Close-coupled unit can be installed horizontally, vertically or at any



Simple mounting bracket facilitates easy installation

angle. Simple mounting bracket supports both pump and motor.

Description: Type LX Bilton general-purpose pump has common SS shaft and mechanical seals. Balanced bronze impeller is fully enclosed.

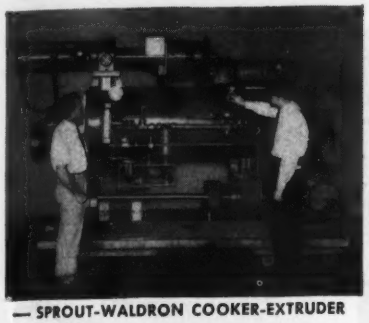
Motor ratings for line of pumps range from 1/3 hp to 7½ hp, single phase or three phase.

Supplier: Byron Jackson Pumps, Inc., PO Box 701, Lawrenceburg, Indiana.

6867 on Reader Service Slip.

NEW LOWER COST

One Unit Process



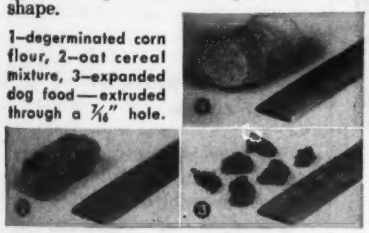
— SPROUT-WALDRON COOKER-EXTRUDER

CONTINUOUSLY COOKS, EXTRUDES CEREAL GRAINS

Sprout-Waldron research and development now offers single unit economy for continuous pressure cooking or gelatinizing of cereal grains. The new S-W COOKER-EXTRUDER creates an expanded or non-expanded, extruded and easy-to-handle product in *one efficient, low cost production process.*

Simplified operation and maintenance provide an infinite variety of product sizes and shapes. Steam pressure replaces mechanical friction "cooking" — with only ¼ to ½ the horsepower of friction type extruders.

Positive control throughout includes provision for variable cooking temperatures, cooking retention time, degree of material agitation and product size-shape.



1—degerminated corn flour, 2—oat cereal mixture, 3—expanded dog food—extruded through a 7/16" hole.

Write for Specification Sheet 224 and complete information.

CW/111

SPROUT-WALDRON

Muncy, Pennsylvania

Size Reduction • Size Classification • Mixing
Bulk Materials Handling • Pelleting

6865 on Reader Service Slip.

Rietz

EQUIPMENT FOR THE FOOD PROCESS INDUSTRIES

the most important food companies in the world use Rietz equipment for

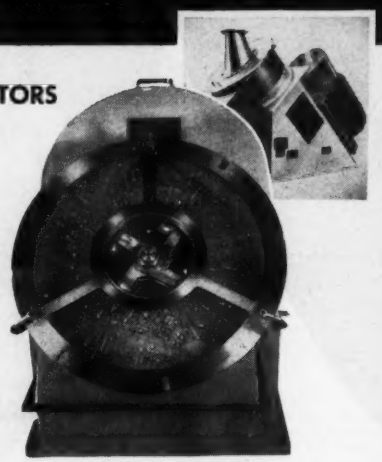
SIZE REDUCTION • MIXING • HEAT EXCHANGE

because they want the benefits of

RIETZ DESIGN
RIETZ DEPENDABILITY
RIETZ SERVICE

Many of these companies are listed in Rietz Bulletin No. R-507 sent to you on request

ANGLE DISINTEGRATORS typify Rietz quality and performance



*Applications Include:

- Wet or dry grinding of difficult materials
- Fine pulping or pureeing
- Coarse crushing or shredding
- Fine dispersion
- Blending
- Homogenizing

* *Depending on screen size and RPM*

5600 RPM was stopped stroboscopically to illustrate three major Rietz Angle Disintegrator advantages

1. 360° effective screen surface
2. Rapid grinding action between rotors and screen
3. Complete accessibility for cleaning

Sales and Engineering Offices in
CHICAGO HOUSTON SEATTLE LOS ANGELES

Rietz MANUFACTURING CO.

Santa Rosa, Calif. • West Chester, Penna.

DISINTEGRATORS • PREBREAKERS • EXTRUCTORS • THERMASCREWS

6868 on Reader Service Slip.

POWELL
CORROSION-RESISTANT
VALVES

Performance makes the world of difference

Fig. 2474BSW—Bell-o-Seal (Packless) O.S.& Y. Globe Valve for 150 pounds W.P. Available in various corrosion-resisting metals and alloys. Can be furnished with screwed, flanged, socket welding or butt welding ends.

Fig. 2345—Stainless Steel, screwed end Swing Check Valve for 300 pounds W.P. Available also with flanged or socket welding ends. Face to face and end flange dimensions of flanged end valves conform to latest standards.

Fig. 6003SS—Large Stainless Steel Gate Valve for 600 pounds W.P. Face to face and end flange dimensions conform to latest standards. Sizes ½" to 24", inclusive.

Powell pure metal and special alloy valves have long been recognized by the Chemical and Process Industries as leaders in the field of corrosion-resistant flow control equipment.

The result of painstaking research; years of experience in modern foundry practice, pattern limitations, and machining possibilities, Powell Corrosion-Resistant valves can be depended upon for long uninterrupted service, with little or no maintenance, and freedom from contamination of end product.

They are available in a wide selection of materials ranging from "A" to "Z" (Aluminum to Zirconium) to handle practically every known corrosive media. For complete details contact your nearby Powell Valve Distributor—or write directly to us.

Powell . . . world's largest family of valves

THE WM. POWELL COMPANY • DEPENDABLE VALVES SINCE 1846 • CINCINNATI 22, OHIO

6869 on Reader Service Slip.

Quickly determine moisture content, temperature

Uses: For determining moisture content and temperature of fruits, nuts and vegetables.

Features: Economically priced moisture meter indicates moisture in less than one minute. It is simple to operate, all that is required is placing temperature prod in fruit bin and inserting test prod in product. Per cent moisture is read directly from scale.

Portable instrument weighs less than 5 lb. Its dimensions are 6¾ in. by 9¼ in. by 2¼ in.

Description: Westach Moisture Meter has 6-in. scale for direct-reading electric thermometer and for reading moisture content.

Three models available are calibrated to indicate moisture content in 12-24 per cent, 5-20 per cent and 20-30 per cent range.

Supplier: Westberg Mfg. Co., 144 S. Coombs St., Napa, Calif.

6870 on Reader Service Slip.

No moving parts for water chiller

Vacuum refrigeration is usually used to chill water to temperatures from 35 to 60 F.

Principle of operation is based on fact that water boils at lower tmperature as surrounding air pressure drops. Since some of water's sensible heat is used to supply latent heat of vaporization for boiling, water is cooled.

At high vacuums, it is even possible to sub-cool ice; transform solid to vapor phase by direct evaporation. This sub-

limation process finds application in freeze drying.

Equipment for vacuum chilling, Chill-Vactor, is described and illustrated in eight-page catalog, Vacuum Cooling, released by Croll-Reynolds Company, Inc.

Literature discusses in detail principles of operation, advantages of chilling method and some applications. Four graphs relate steam and water requirements to cooling-water temperatures for four chilled-water temperatures.

6871 on Reader Service Slip.

Adjustable-depth temperature probe

Uses: For taking temperature of non-rigid materials at desired depth.

Features: Dial selector on needle probe is turned to adjust depth of penetration. On withdrawing from material, combination adjustable stop and sheath protect needle.

Portable models of probe use standard dry-cell batteries. Probes are also made for AC power

Sensitivity of instrument is within one-quarter of a degree and accuracy is within 0.2 per cent of first third of scale and within 0.7 per cent of balance of scale.

Description: Probes with spring-loaded depth guide utilize thermally sensitive resistors or thermistors. Model 4412 measures on three scales between 32 F and 410 F. Ranges from 32 F down to −150 F are also available.

Supplier: Atkins Technical, Inc., 1276 W. Third St., Cleveland 13, Ohio.

6872 on Reader Service Slip.

ATLAS-PACIFIC COONS PEAR PEELER

A COMPLETELY *New* DESIGN

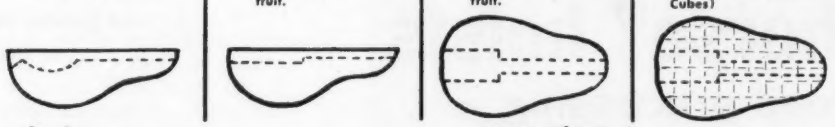
- MICRO THIN PEELING
- MORE FRUIT FLAVOR
- HIGHER SPEED
- ADJUSTABLE WHILE RUNNING
- ANY STYLE FRUIT—HALVES, WHOLE, SALAD, FRUIT COCKTAIL
- 10 - 25% MORE YIELD

CONVENTIONAL GRADE FRUIT
Adjustable Calex and seed cell position.

COONS STYLE GRADE FRUIT
Quick change from Whole to Halved fruit.

COONS STYLE WHOLE FRUIT
Quick change from Halved to Whole fruit.

WHOLE FRUIT FOR COCKTAIL AND SALAD
(6-8% More Usable Cubes)



GENERAL SPECIFICATIONS
MODEL NO. APC-S7

Overall Length	68"
Overall Width	52"
Overall Height	45"
Feed Height	36"
Discharge Height	18"
Capacity, pears per min.	72
HP Required	1
Weight, approx. in lbs.	2,000
Export weight, approx. in lbs.	2,500
Cubic Measurement, cu. ft.	125

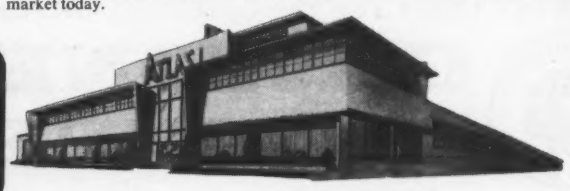
design:

This new Atlas-Pacific Coons Pear Peeler is completely new and revolutionary in design. Its precision operation allows for no waste time. As the machine is peeling and removing the stem, core and seed cell, it is being loaded for the next operation. This unit will handle up to 72 pears per minute easily (6 at a time). To save further time, the machine is adjustable while in operation. By operating two dials at the side of the machine, the knives that remove the seed cells can be adjusted to conform with the position of the cell, thus removing only the cell, leaving a maximum amount of fruit. The second dial adjusts for the calex and stem cut. Machines are equipped with rotary type peeling heads. (This operation is unparalleled for maximum efficiency, speed as well as greater yield.)

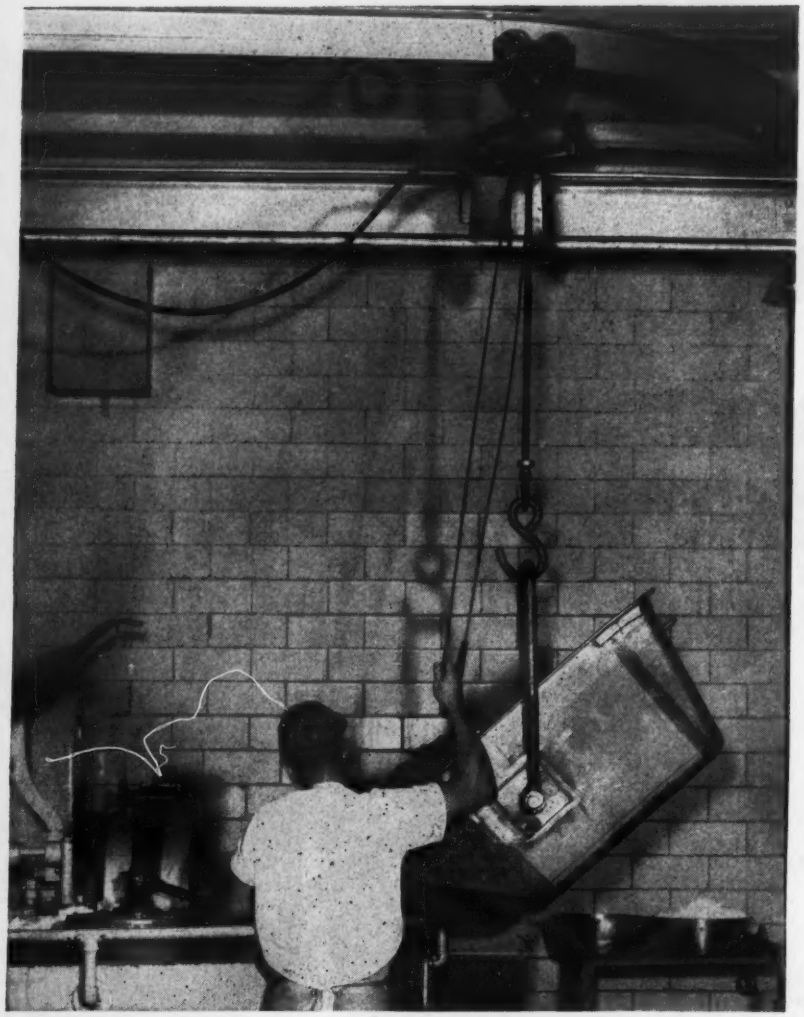
operation:

Requires only minutes to change for processing any style fruit (see illustrations above). The blades that remove the seed cells is the major change. This unit processes six pears at a time, either graded or ungraded. The operator places the fruit stem end down into the self adjusting cups. As the fruit tips forward while in the cup to be processed, it is gently held in position by four fingers to assure removal of core and seed cells on center. The removal of the stem end, core, seed cell and peeling operation all occur simultaneously. At the split second, the loading cups deliver and release the fruit, they return to original position for reloading and remain in a stationary position while the fruit is being processed, thus allowing the operator sufficient time to reload. Actually, the operator has three out of every five seconds for reloading. The Micro-thin ribbon peeling of graded or ungraded fruit means more fruit flavor in the can, leaving natures concentrated fruit flavor which is right under the skin (the thinner the peel, the more flavor). The efficiency of design in this machine, coupled with its minute adjustment features produces 10 to 25 per cent greater case yield than other machines on the market today.

ATLAS-PACIFIC ENGINEERING COMPANY, INC.
1321 67th Street • Emeryville, Calif.



6873 on Reader Service Slip.



"Work-horse" hoists
speed food processing

Charging a 500-lb.-capacity cutter and mincer, this man easily and quickly spots heavy stainless steel bucket in position—*in a matter of seconds.* He controls load with one hand while Gardner-Denver air hoist does *all* the work. He's using the "work-horse" hoist of the line—powered by a piston-air motor. But this is just one of the complete line of Gardner-Denver air hoists (from 150-lb. to 2-ton capacity). And where speed is of primary importance in your lifting jobs, check the new rotary motor air hoist—the "race horse" of our line. Whichever type you choose, you always get the swift, safe lift you need.

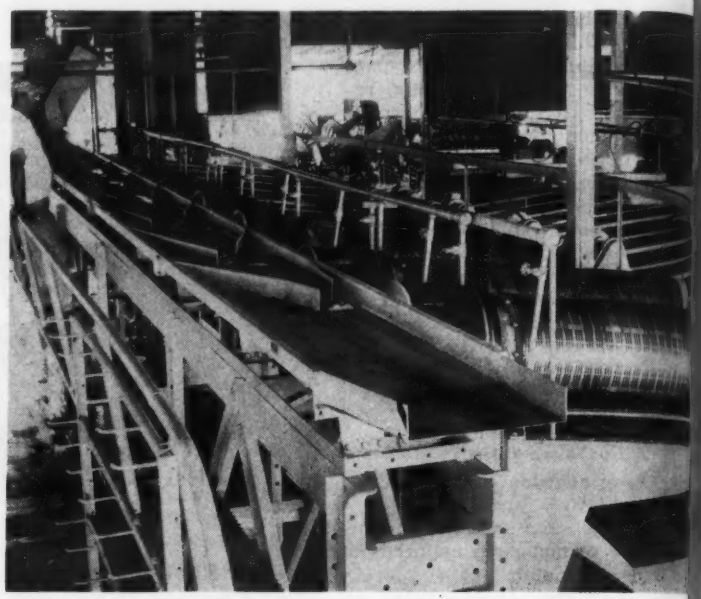
EQUIPMENT TODAY FOR THE CHALLENGE OF TOMORROW

GARDNER-DENVER Since 1859

GARDNER DENVER

Gardner-Denver Company, Quincy, Illinois
In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Ave., Toronto 16, Ontario

6874 on Reader Service Slip.



"Brush-offs" on oscillating conveyor equally distribute and channel snap beans to openings in 24 in. wide by 40 ft long conveyor deck. Beans drop through openings and slide into snippers

Uniformly feeds green beans to battery of 12 snippers

Vibratory conveyor with series of guides and feed holes applicable to many other products

FRANK L. BONEM
Associate Editor

Problem: To obtain consistently uniform snipping of green beans, feeding of snippers must be at a constant, uniform rate. To do this manually is practically impossible.

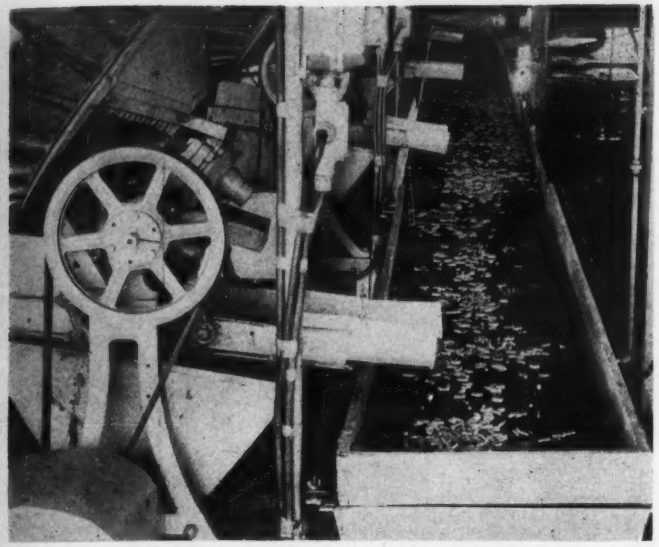
Feeding of the Model F snippers — made by Chisholm-Ryder Company, Niagara Falls, N.Y. — should proceed at a rate which will keep them slightly less than two-thirds full at all times.

Snippers have a capacity of 800 lb/hr.

Solution: At Fruitland, Md. plant of Dulany Foods, Inc., Edgar Causey, plant engineer, replaced a flat-belt conveyor — from which two to three men shoved the snap beans into the snippers — with an oscillating conveyor.

To achieve a uniform discharge from this conveyor to the 12 snippers, Causey had holes cut into the deck, one for each machine.

To divide the flow of beans and to channel it to the 12 holes, Causey designed vertical guides or "brush-offs"



Oscillating, triple-deck conveyor which Dulany adapted to grading cut beans is 18 in. wide and 40 ft. long

At its Exmore, Va. freezing plant, pieces of beans from four Urschel cutters are directly deposited onto top deck. Prior to cutting, round beans are size-graded according to diameter

Top deck of conveyor has perforations of such size that only pieces shorter than one inch fall through. Second deck is also perforated, but holes are smaller than those of first deck. Pieces retained on second deck are used for mixed vegetables; nubbins or remnants that fall through to third deck, which is a trough, are discarded

which were welded to the deck, see photo above-left.

Brush-offs were welded at only one end; ends nearest the holes were left flexible. Thus flow of beans to holes can be adjusted by bending free end.

Green beans, after dropping through openings, flow through funnels into the snippers.

Flexmount oscillating conveyor used by Causey is made by Link-Belt Company, Prudential Plaza, Chicago, Illinois. This type of conveyor has an eccentric drive and flat-spring support legs; is designed for light duty and gentle handling. Capacities range up to 25 T/hr of 100 lb/cu ft material in sizes from 100 mesh up.

Results: With automatic feeding, there is no more spillage and need to change openings on snippers is minimized.

Only one man is necessary now and his main function is to supervise the operation.

Dulany setup has been so successful that when it was seen by some New York and Pennsylvania packers, it was promptly copied by them.

Some of these packers even went one step further. To obtain uniform feeding of all machines, they staggered the holes across the width of the conveyor, thereby eliminating need for brush-offs.

In addition, to prevent overloading of snippers, these packers mounted the conveyor-to-snipper connecting chutes on pivots. Thus when snippers are about 80 per cent full and feed starts to back up into chutes, chutes tilt backward and discharge into a run-around conveyor provided for the overload.

6875 for Flexmount oscillating conveyors on Reader Service Slip.

EQUIPMENT TODAY FOR THE CHALLENGE OF TOMORROW

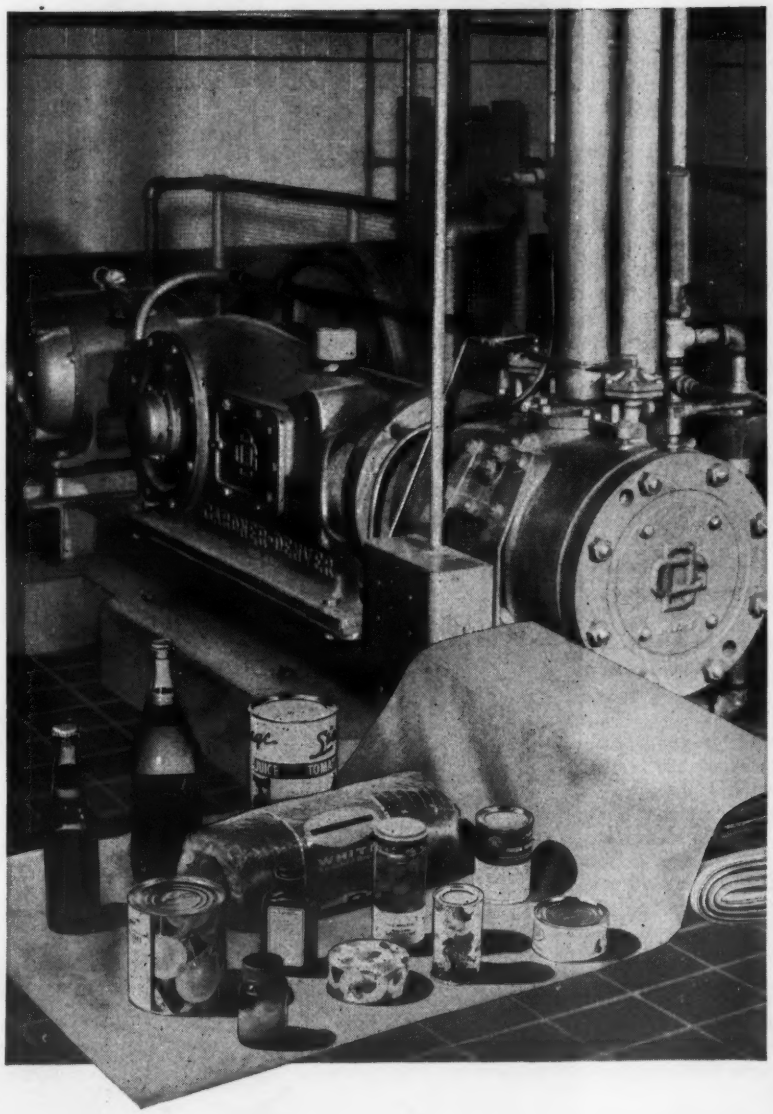
GARDNER-DENVER

Since 1859

GARDNER DENVER

If a trace of oil in your air line is *too* much, find out about Gardner-Denver oil-free air compressors. They've enabled many an industry to utilize low-cost, compressed air power without use of special filters. Parts in the cylinder need no oil or water lubrication. Available with either carbon pistons and rings, or aluminum pistons and rings made of DuPont Teflon with 25% Fiberglas fill. Oil-free compressor sizes from 4 to 1400 cfm. Write for details. Gardner-Denver Company, Quincy, Illinois.

Pure, oil-free air
helped make these products better



6876 on Reader Service Slip.

Cherry-Burrell knocks the wind out of peanut butter

It's a peanut's lot to be crushed, cracked, crumpled and thrown at umpires. But after they're made into peanut butter, they're given the treatment of their lives to remove air from the product. Any air that's left affects flavor and short-fills jars. One Eastern processor needed a more effective method of deaerating peanut butter. He asked Cherry-Burrell to solve the problem.*

Cherry-Burrell engineers studied the situation and recommended a modified vacuum-pressure Round Processor. A special disperser injects a thin film of peanut butter into the processor, exposing trapped air to the vacuum. Specially designed agitators promote faster heat transfer and float trapped air to the surface. Unique surface breakers allow air to escape and to be removed by the vacuum. Now the manufacturer's peanut butter stays flavorful in the jar, and each jar is filled full every time.

Highly trained technicians will test your product without obligation in a Cherry-Burrell laboratory. They will show you how Cherry-Burrell food processing equipment can help you improve your operation and profit position. Your specialists are invited to participate in the testing. Call or write Cherry-Burrell today.

**Case history on request.*

EQUIPMENT FOR HOMOGENIZING, HEATING, COOLING, FLAVORIZING, STORING, SEPARATING, FREEZING, MIXING, PACKAGING AND CONVEYING. WRITE FOR YOUR FREE CATALOG.

CHERRY-BURRELL CORPORATION
CEDAR RAPIDS, IOWA

6877 on Reader Service Slip.

Prevents sticking, eases cleaning

Edible oil extract imparts no taste or odor to foods

New aid for processors who have sticking problems is a vegetable oil which is sprayed on in very thin coating.

Already successfully being used by large Chicago baker in bread molds, Pam Industrial Spray should find application in bakeries and wherever foods are baked or cooked.

Spray may also prove useful in facilitating release of foods in certain freezing operations.

Since spray adds no calories to products, it can be readily used in preparing dietary foods.

Vegetable oil extract is predominantly lecithin. According to a testing laboratory, its upper and lower temperature limits are beyond upper and lower limits encountered in food processing.

Oil spray seals minute pores in metal surface. As a result, sticking of food particles is prevented and cleaning is made easier.

Samples of Pam Industrial Spray are available on request.

Supplier: Pam Industries, Inc., 540 N. Lake Shore Drive, Chicago, Ill.

6878 on Reader Service Slip.

Comprehensive listing of process instrumentation

For automatic control of sugar production from cane or beets to final product

Manual of 136 pages covers instrumentation of complete sugar manufacturing process, from beets or cane to final product. Assembled for the first time under one cover, it presents step by step details of the process including a listing and brief description of instruments needed to control each unit operation.

Numerous schematic diagrams illustrate the functions of every instrument used in a particular stage of the process.

All material in Sugar Man-

ual M38-1, available from Minneapolis-Honeywell Regulator Company, Industrial Division, has been arranged for quick, easy location.

After introduction, book presents definition of terms followed by conversion tables. Main section, which covers description of process, introduces subject with two flow diagrams.

Manual, Instrumentation for the Sugar Industry, concludes with section on industrial digital computors and automatic data handling machines.

6880 on Reader Service Slip.

Portable mixer adjustable for optimum operating position

Features: Position-indexing device on housing ball-and-clamp socket provides means of adjusting position of propeller mixer for optimum mixing efficiency. Mixer can be turned 90° in vertical plane and 360° in horizontal plane. Position of optimum operating efficiency is pinpointed by index. Use of index

Portable units can be mounted or removed from tank by use of lifting eyes and positioning handle

facilitates simple and quick repositioning.

Description: Lightnin' Mixers, consisting of portable and fixed-mounting units, are made with direct drives for speeds of 1750 and 1150 rpm. They are also made with single-reduction gear drives for speed of 350 rpm.

Portable mixers are available in sizes ranging from ⅛ to 3 hp. Fixed-mounting units are made in all but the ⅛-hp size.

Single or dual propellers, in geometrically similar sizes and based on best combination of flow and head characteristics, are provided.

Supplier: Mixing Equipment Co., Inc., 170 Mt. Read Blvd., Rochester 3, N.Y.

6881 on Reader Service Slip.

106-Acre
BERGEN MALL
Shopping Center

One of world's largest. Has central heating plant; incinerator operation generating part of steam . . . 13 individual cooling towers . . . air-curtains to avoid doors in main buildings . . . 8,600 car parking.

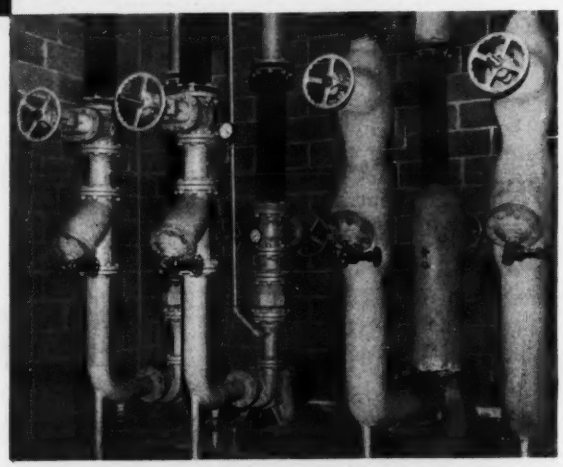
Owner — ALSTORES REALTY CORP.
Architects-Engineers — JOHN GRAHAM AND COMPANY, NEW YORK & SEATTLE
Mechanical Contractor — FRANK A. McBRIDE CO., PATERSON, N. J.

'Low-cost, trouble-free control of the complex piping system obtained with JENKINS VALVES

250,000 people a week come to this huge Northern New Jersey shopping center to satisfy most of life's needs other than sleep. Its shops, banks, offices, theaters, restaurants and varied personal services occupy 920,000 square feet of buildings.

The plumbing, heating, air conditioning, fire protection and sanitation facilities of this city-like project are as hard-working as they are complex. Valves with extra-stamina were needed for control of the piping system. Every possible protection against troubles and the high costs of valve maintenance and replacement was demanded. It was obtained with the specification so often written for tough, critical jobs . . . *"valves to be* JENKINS".

Especially since they cost no more, it is surely worthwhile to insist on Jenkins Valves for your valve jobs. Jenkins Bros., 100 Park Avenue, New York 17.



Valves on air conditioning system pumps.

JENKINS
LOOK FOR THE JENKINS DIAMOND
VALVES
JENKINS SINCE 1864 Jenkins Bros

SOLD THROUGH LEADING DISTRIBUTORS EVERYWHERE

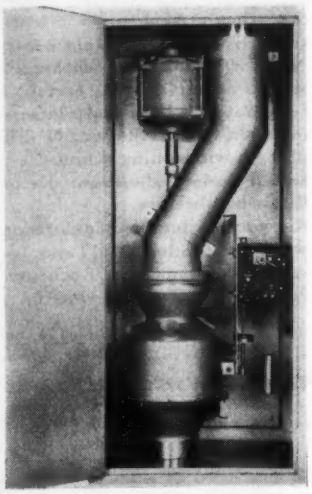
6879 on Reader Service Slip.

Continuously weighs, meters dry flowing materials

Has accuracy of ±1%

Uses: For weighing and measuring wide range of dry flowing materials without interrupting flow.

Features: Meter is designed to provide instantaneous or



Meter is 46 in. high, 22 in. wide and 16 in. deep; can usually be installed in existing spouting systems

recallable stream-flow data. It is not intended to substitute for beam scales.

Instrument operates on impact principle, translating unit weight of stream flow into electrical current through a transducer. Accuracy tests have shown variance of meter to be confined to maximum of plus or minus 1 per cent.

Description: IPI Dry-Flow Meter is made in different sizes to meet varying requirements. Two models available cost less than $1000 without instrumentation.

Optional instruments provide direct readings of unit weight per unit time, make permanent recordings of flow or totalize readings for any given time period.

Supplier: Industrial Processes, Incorporated, 621 S. W. Morrison Street, Portland 5, Oregon.

6882 on Reader Service Slip.

Why are so many food processors specifying "Big Sam"?

Because "Big Sam" gives them *continuous* high capacity clarification . . . while protecting delicate flavors, true colors, nutritional values. "Big Sam's" sanitary design—stainless steel with smooth polished surfaces throughout hood, sludge discharge and all product contact areas—prevents contamination and "entrapment" of food particles. By replacing outmoded batch methods with fully automatic around-the-clock operation, they have cut costs, increased profits. Chances are "Big Sam" will do the same for you . . . ask for information on the WESTFALIA model SAMN-15037 Automatic De-Sludger.

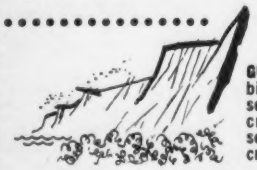
WESTFALIA SEPARATOR | CENTRICO INCORPORATED

75 WEST FOREST AVENUE, ENGLEWOOD, NEW JERSEY • PHONE LOWELL 9-0755
WESTERN DIVISION: 3315 CAXTON COURT, SAN MATEO, CAL. • FIRESIDE 5-7065

6883 on Reader Service Slip.

MEER

...for gums of all types specially processed for the food industry



GUM CARAGEEN ... used as a stabilizer, emollient, demulcent; offers some emulsifying action. For ice cream, chocolate milk, creamed soups, syrups, sherbets, whipped cream.

GUM ARABIC ... its uses depend upon its action as a protective stabilizer, the adhesiveness of its water solutions, and as a thickener. Common in citrus oil emulsions, flavor emulsions, spray dried flavors, candies and jellies.

GUM GUAR ... an extremely versatile gum, Guar is used as a suspending agent, viscosity modifier, stabilizer, dispersant, selective flocculant. For cheese spreads, ice cream, salad dressings and sauces, desserts, processed meats.

For more information on these and other water soluble gums that Meer Corporation has assembled, assayed, processed and distributed since 1926, write for descriptive technical bulletin.

MEER CORPORATION

Warehoused at:
318 W. 46 St., New York 36 • No. Bergen, N. J.
325 West Huron Street, Chicago 10, Illinois
CANADA: P. N. Soden & Co., Ltd., Toronto 18 • Montreal 22

6884 on Reader Service Slip.

colton-hope fillers and accessories give you special high-speed machines at the price of standards.

ARTHUR **COLTON** COMPANY
3485 E. Lafayette, Detroit 7, Michigan

60-7

6885 on Reader Service Slip.

processing

5 applications for indicating controller

Indicating pneumatic controller may be used for controlling pressure, temperature, humidity, flow and liquid levels. In pressure applications, instrument has range from vacuum to 10,000 psi; for temperature applications, its range is from −100 F to +1000 F.

Specifications and performance chart of Series 624 Indicating Pneumatic Controllers are presented in 6-page Bulletin DM058, released by The Bristol Company. Literature also explains operations and points out design features.

6886 on Reader Service Slip.

Accurate, portable pH meter

Small, light-weight pH meter is shock resistant, has accuracy of ± 0.05 pH, reproducibility of ± 0.02 pH. Meter has twin scales from 0 to 8 pH and from 6 to 14 pH.

Electron pH meter utilizes single, combination electrode and is stated to require standardization only once a week. It has drift-free, stabilized indicator needle and reference pointer. Meter is described and illustrated in two-page technical data sheet, available from Sel-Rex Instruments, Inc.

6887 on Reader Service Slip.

Sanitary screw pump has many applications

Ranging in capacity up to 175 gpm and in discharge pressure up to 75 psi, screw pump can handle low-viscosity liquids — such as clear soups—to high-viscosity pastes —such as peanut butter. Unit can also pump mixtures with suspended solids, such as potato salad.

Operation of Moyno Pump is similar to precision screw conveyor. As a rotor turns within a stator, cavities are formed which progress toward discharge end of pump, carry-

NEW **Taylor LIN-E-AIRE* Valve Actuator**

Sets new standard in precision control:
1. Greater power, size for size.
2. Constant diaphragm area for improved control.
3. Precision alignment for friction-free stroking.

CHECK THESE FEATURES:

Strength of drawn steel diaphragm case permits high-pressure operation when needed.

Long stroke with constant areas. Note deep-convolution-diaphragm, shaped drive plate, long spring.

Long life and low hysteresis because of nylon-reinforced Buna-N diaphragm with rolling action.

Easiest spring adjustment due to thrust ball-bearing.

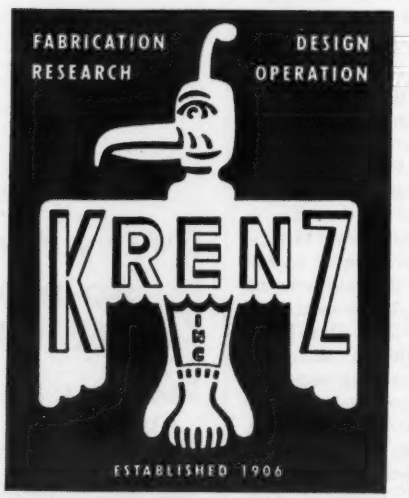
Ask your Taylor Field Engineer or write for **Bulletin 98316.** Taylor Instrument Companies, Rochester, New York or Toronto, Ontario.

*Trade-Mark

Taylor Instruments **MEAN ACCURACY FIRST**

6888 on Reader Service Slip.

EVAPORATORS



OSCAR KRENZ INCORPORATED
ASHBY AT SIXTH STREET
BERKELEY 10, CALIFORNIA
Telephone THornwall 5-1400

PROCESSING EQUIPMENT that PAYS OFF in PERFORMANCE!

- Evaporators
- Vacuum Pans
- Flash Break Units
- Mixing Tanks
- Condensers
- Heaters
- Rotary Coil Vessels
- Kettles
- Essence Recovery Systems

Write for complete details

6889 on Reader Service Slip.

ing the material being handled.

Characteristics and operation of pump are covered in introductory section of twenty-page bulletin, available from Moyno Pump Division, Robbins & Myers, Inc. Section is followed in catalog by engineering data and selection table.

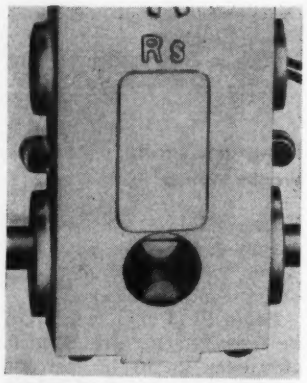
Successive sections cover large variety of pump models available, product photos and dimension drawings. Full specifications are given in each section of Bulletin 100. An alphabetical listing of over 200 applications is included.

6890 on Reader Service Slip.

From 1/16 to 1 in. solenoid valves

Uses: For metering, sampling or "on-off" control in applications involving corrosive fluids, slurries or dry powders.

Features-Description: Normally-closed solenoid valves can be operated manually or automatically from instruments. Consisting of a rubber body that is pinched closed by



Flow through solenoid valve is straight through in either direction. There are no moving parts, seats or discs in fluid stream

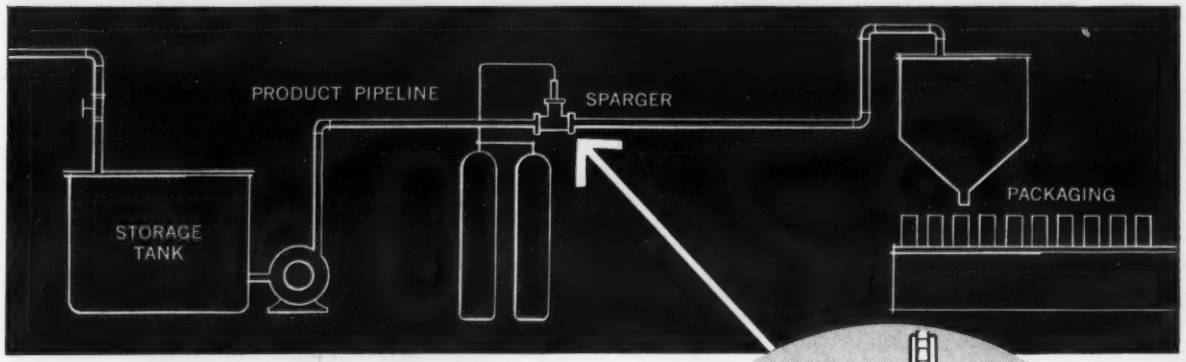
spring-loaded solenoid mechanism, valves are stated to have gas-tight shut off under vacuum or pressure.

Series RS valves are made in body sizes from 1/16 up to 1 in. They are encased in cast aluminum housings.

Maximum pressure rating

GAS SPARGING

. . . an exciting new method of treating foods and beverages to insure retention of important customer acceptance qualities



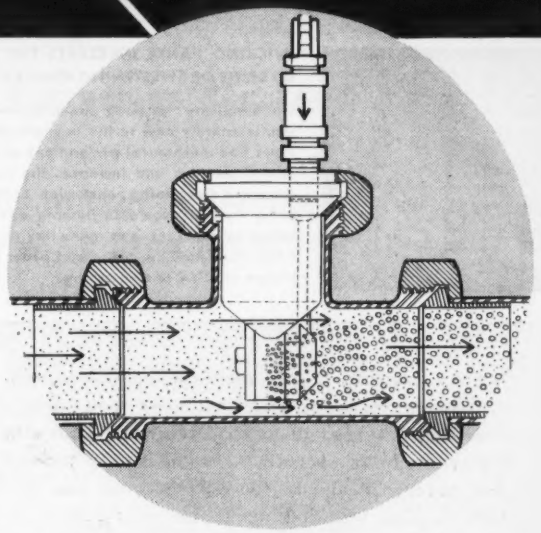
. . . the unique

AIRCO GAS SPARGER

is utilized for reducing product oxygen and improving the shelf life, appearance and texture of processed foods and beverages. Sparging is done during the processing flow and involves little or no disturbance of existing equipment. Specifically, sparging with nitrogen, carbon dioxide, nitrous oxide, oxygen and argon accomplishes the following —

- Removal of oxygen from oxygen-sensitive liquids such as citrus juices, edible oils and essential oils, wines, etc.
- Fluffing of mayonnaise, salad dressings, peanut butter, ice cream, etc.
- Controlled fermentation of wines.
- Light carbonation of wines and other beverages.

The Airco Sparger is remarkably easy to install and low in cost. Check further as to the profitable possibilities of gas sparging your products. For a copy of a descriptive folder on Airco's Gas Sparger, please send coupon today.



Close-up view of Airco Sparger in action.

At the Frontiers of Progress You'll Find an Air Reduction Product

AIR REDUCTION COMPANY, Inc.
CUSTOMER SERVICE PACKAGING LABORATORY
1400 E. Washington Ave.
Madison 10, Wisconsin

AIRCO

AIR REDUCTION COMPANY, INCORPORATED
Customer Service Packaging Laboratory
1400 East Washington Avenue
Madison 10, Wisconsin Dept. FP-11

☐ Please send complete information on Sparging.

Name.....
Title.....
Company.....
Address.....
City.....Zone.....State.....

6891 on Reader Service Slip.

BRAND NEW FROM SIMPLICITY!

3'x3' MULTI-PURPOSE SCREEN

PRICKING PANEL INCREASES THE RATE OF BRINE OR SWEETENING PENETRATION

The Simplicity "pricking panel," shown at left, is entirely new in the industry; it provides fine mechanical perforations of fruits and vegetables and increases the rate of brine and sweetening penetration. Each and every fruit or vegetable passing over this vibrating panel receives many tiny perforations, thus enabling faster and better penetration of brine or sweetening.

pricking
scalping
sizing
dewatering
trash removal
industrial
waste removal

The new Simplicity 3' x 3' Multi-Purpose Screen, with its complete versatility, offers the entire food industry a revolutionary way to cut food processing costs with higher production speeds, a more uniform product and greater flexibility for multi-purpose use. The Multi-Purpose Screen is adaptable to a number of operations and has been used successfully to size, prick, dewater, scalp and remove trash from a number of fruits and vegetables.

The screening section of the Simplicity Multi-Purpose Screen can be equipped with screen cloth of any specification and can be easily replaced with the new pricking panel. The machine itself can be constructed of mild or stainless steel and stainless steel wire cloth is normally used.

Simplicity offers expert counsel for food screening problems based on unequalled experience in screen applications. For more information on Simplicity food screening equipment, write Department 7, Simplicity Engineering Company, Durand, Michigan.

Simplicity
TRADE MARK REGISTERED
ENGINEERING COMPANY • DURAND 6, MICHIGAN

SALES REPRESENTATIVES IN ALL PARTS OF THE U.S.A.

FOR CANADA: Simplicity Materials Handling Limited, Guelph, Ontario.

FOR EXPORT: Brown & Sites, 50 Church Street, New York 17, N. Y.

6892 on Reader Service Slip.

for smallest sizes is 50 psig, and standard maximum temperature rating is 180 F.

Supplier: RKL Controls, Inc., Hainesport Industrial Park, Hainesport, N.J.

6893 on Reader Service Slip.

Continuously analyses chloride ion concentration

Uses: For continuously and automatically determining chloride ion concentration in aqueous solutions.

Features: Analyzer is available in three standard ranges: 0.1 to 10 ppm, 1 to 1000 ppm or 10 to 10,000 ppm. Instrument is accurate in most applications to within ±5 per cent of total chloride ion present in solution.

Description: Ion measurements are read directly from Chloride Ion Analyzer's meter or from conventional potentiometric recorder.

Instrument has silver-silver chloride electrode and thermocompensator which automatically adjusts for temperature from 32 to 212 F. All necessary adjustments are made through two controls.

Supplier: Beckman Scientific and Process Instruments Divisions, 2500 Fullerton Road, Fullerton, Calif.

6894 on Reader Service Slip.

Compact, sealless water pump

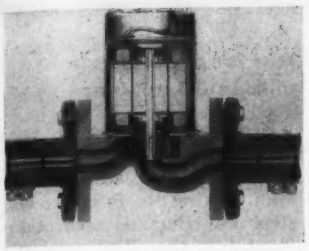
Uses: Pump is especially designed for use on closed water systems free of foreign objects and materials.

Features: Pump, which can be installed in any position, circulates up to 12 gpm and produces a ten-ft head at shutoff. It is suitable for pressures up to 30 psi and temperatures to 220 F.

Rotor, shaft and impeller form a single assembly, enclosed or "canned" in corrosion-resistant liner.

Description: Model 400A Dynapump measures 6 in. by 7 in. and weighs 11 pounds.

It requires no external lubrication. Pumped fluid circulates in rotor chamber and



Canned pump is equipped with rubber flanges for quiet operation

acts as bearing lubricant and motor coolant.

Pump is made for operating on either 115 or 220 v single phase, 50 or 60 cycles. Automatic overload protection is provided.

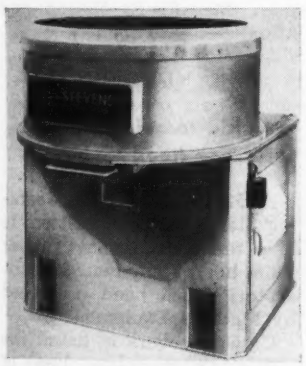
Supplier: Fostoria Corporation, Dynapump Division, Dept 78, 1200 N. Main St., Fostoria, Ohio.

6895 on Reader Service Slip.

Mixes 400 pounds in less than 1 minute

Uses: For mulling wide variety of dry and semi-dry food products.

Features: Under months of field testing, muller has proven



Muller is easy to load, unload

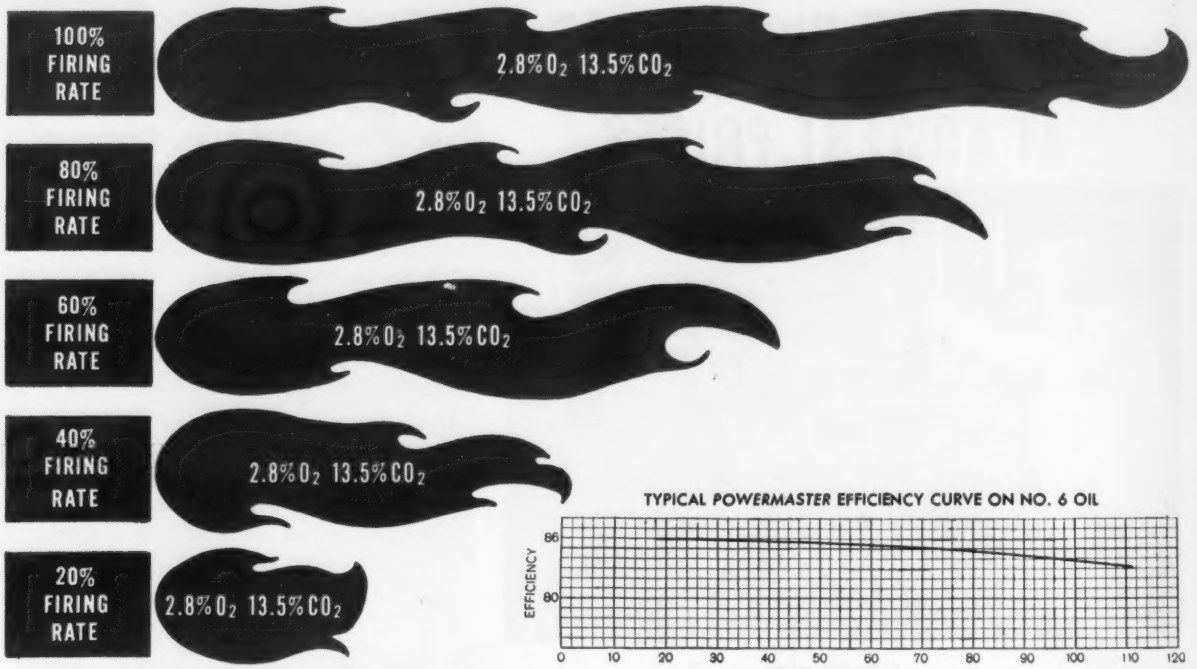
to do fast, economical job of batch mixing. Machine mixes 400 lb, its rated capacity, in less than one minute.

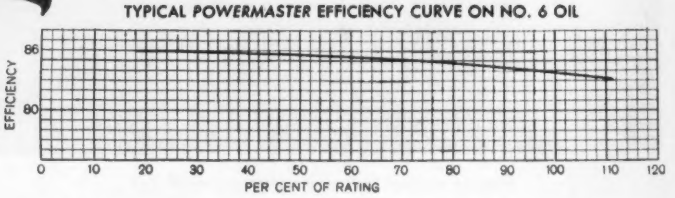
Description: Stevens Muller stands 4 ft high and occupies a floor area of seven square feet.

Supplier: Frederic B. Stevens, Inc., 1800 - 18th St., Detroit 16, Mich.

6896 on Reader Service Slip.

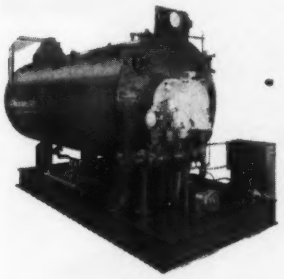
FROM THE WORLD LEADER IN PACKAGED AUTOMATIC BOILERS AND BURNERS





Only *Powermaster*® gives you this type efficiency

Constant fuel-air ratio assures maximum efficiency at any load . . . cuts operating costs . . . returns investment faster



Whether you operate a *Powermaster* boiler from a low of 20% to a high of 100% of capacity, you get the same high constant efficiency. With O&S exclusive 5 to 1 turndown, fuel-air ratio is maintained at all loads with the same low percentage of excess air (2.8% O_2) and high percentage of CO_2 (13.5%).

This constant efficiency is important to you for three reasons: 1. Lower operating costs; 2. faster return on your investment; 3. more uniform heating, more uniform process and improved product quality.

Whether your requirements are for comfort heating, process or power, you'll pay for your boiler investment faster with an O&S *Powermaster*. For information on all *Powermaster* benefits, call your nearest O&S representative or write for Bulletin 1260.

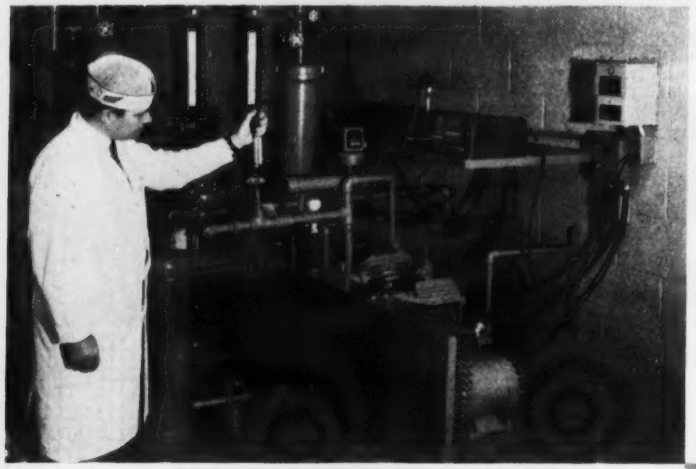
75th Anniversary

ORR & SEMBOWER, INC.
820 Morgantown Road
Reading, Pa. • Since 1885

Powermaster®
PACKAGED AUTOMATIC BOILERS

6897 on Reader Service Slip.

HOW TO GET
HIGHEST PURITY GAS
FOR FOOD PACKAGING
AT LOWEST PRICES



One of several Gas Atmospheres Inert Gas Generators operated by the Borden Co. for packaging dairy products.

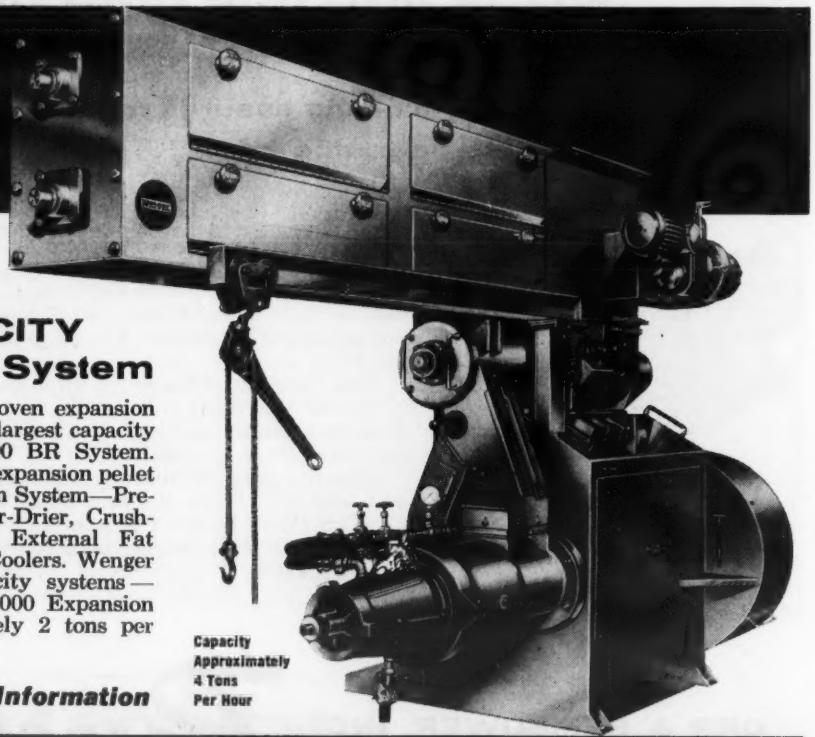
Inert gases, so pure that infra red analyzers can detect only a slight traee of gases other than nitrogen and CO_2, can now be manufactured in any amounts at lowest costs ever. Gas Atmospheres engineers have developed high purity inert and nitrogen gas generation systems to produce any desirable amounts from 250 cfh to 20,000 cfh. What's more, Gas Atmospheres systems are packaged units, complete on a common base, factory-tested and ready to go on-stream with a minimum of installation work.

If you process foods, why not check with the most experienced manufacturer of packaged high purity gas generation systems? Literature available. Write or call *Gas Atmospheres, Inc., 3855 West 150th Street, Cleveland 11, Ohio.*

gas Atmospheres, inc

6898 on Reader Service Slip.

Wenger



INTRODUCES
LARGEST CAPACITY Expansion Pellet System

Wenger—producer of industry proven expansion pelleting systems—introduces the largest capacity expansion equipment—The X 100 BR System. Wenger produces not only proven expansion pellet mills, but The Complete Expansion System—Preconditioners, Pellet Mills, Toaster-Drier, Crushers, Fat Conditioning Feeders, External Fat Application Systems and Pellet Coolers. Wenger also produces two smaller capacity systems—The X 50 BR and The Series 1000 Expansion Systems—both rated approximately 2 tons per hour.

Write Today for Complete Information

Capacity Approximately 4 Tons Per Hour

Wenger Mixer Manufacturing
SABETHA, KANSAS PHONE AVenue 4-2133

Standard of the Industry for Liquid Feed Mixing, Pelleting and Cooling Equipment.

6899 on Reader Service Slip.

laboratory developments

Test for antibiotics in milk in 30 minutes

Research workers at Iowa State University report an improved test for antibiotics in milk. Using a fast growing strain of *Bacillus stearothermophilus*, the TTC reduction test can be run in 30 minutes and the disc assay procedure in 75 minutes.

Tests now in common use require at least 2½ hours, and many considerably longer. A few tests require overnight incubation before results are available.

This special strain of *B. stearothermophilus* is so sensitive to penicillin that as little as .005 unit per milliliter of this antibiotic can be detected. This is about ten times the sensitivity of many of the tests in current use.

Procedures for making standardized preparations of the bacteria available to dairy plants are being investigated. An even faster test using this particular organism is under study at the Dept. of Dairy and Food Industry, Iowa State University, Ames, Iowa. Work is being conducted by Mr. R. T. Igarashi, Mr. R. W. Baughman, Mr. F. E. Nelson and Mr. P. A. Hartman.

A guide to selecting lab fume hoods

A 52-page illustrated catalog designed and written to help technicians select proper fume hood equipment for laboratories has been published by Metalab Equipment Co.

Catalog covers in detail the company's complete line of "Guided Airflow Fume Hoods", service fixtures, accessories, and electrical and mechanical fittings. Special sections are also devoted to dry boxes, blowers, duct work and hood lining materials.

Catalog serves as a fume hood guide to modern planning, lighting, designing, constructing and employing air removal equipment efficiently and safely.

Several pages, with dia-

grams, are devoted to laboratory planning with recommendations given for the proper utilization of floor and wall space. One section is set aside for special applications with toxic, nuclear, corrosive and dangerous materials.

6900 on Reader Service Slip.

Pocket-size refractometer

A pocket-size refractometer is described and illustrated in a 2-page bulletin issued by Epic, Inc.

Although originally designed for sugar solutions, the instrument will be found to be equally valuable with starch, gums, salt solutions, oils, jams, jelly, condensed milk, soft drinks, fruit juice, beer, wines, honey, etc.

Previously, the relatively high price of the refractometer, and the fact that the instrument was bulky and heavy, confined its use to the laboratory. This involved lost time in bringing samples to the instrument from distant parts of the plant, refinery or field. This often led to confusing results.

Instrument, weighing only eight ounces, can be easily carried, is instantly available, and requires only a drop or two of liquid to give an instant reading which is accurate to 0.1% if simple precautions are carried out.

In design the pocket refractometer closely follows that of the larger instruments. Two glass prisms, between which is placed a drop of the liquid to be tested, are mounted on a hinged box.

On directing the instrument toward the light, the edge of the dark shadow formed by the well-know critical angle effect is read by an orthodox optical system upon a transparent scale divided in soluble solids.

6901 on Reader Service Slip.

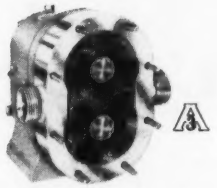
Check page 125 for helpful technical literature

WAUKESHA FOUNDRY COMPANY

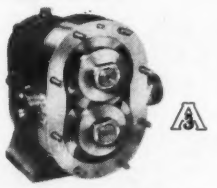
POSITIVE DISPLACEMENT PUMPS

"selectivity"

the right impeller guards your product



Rubber Impellers — dual-lobe or four-lobe design.



Metal Impellers — single, dual or three-lobe in "Waukesha" Metal or 316 Stainless Steel.

International Sales: FMC International, Box 1178, San Jose, California, U. S. A.

CHOOSE: rubber or metal impellers • "Waukesha" Metal or 316 Stainless • capacities from 0 to 300 G.P.M. • vertical or horizontal ports • pressures up to 150 P.S.I.

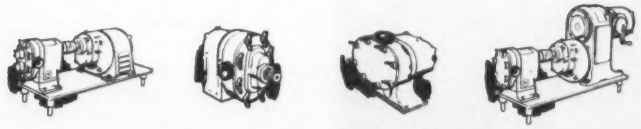
Each revolution of the *wrong* pump impeller can cost you money . . . and impellers are only one of the hundreds of pump variables that can affect your product. With a Waukesha, over 500 pump combinations give "customized" design for your product . . . take the compromise out of pump selection.

These variables assure you of a pump which is custom-designed to the specific demands of your product.

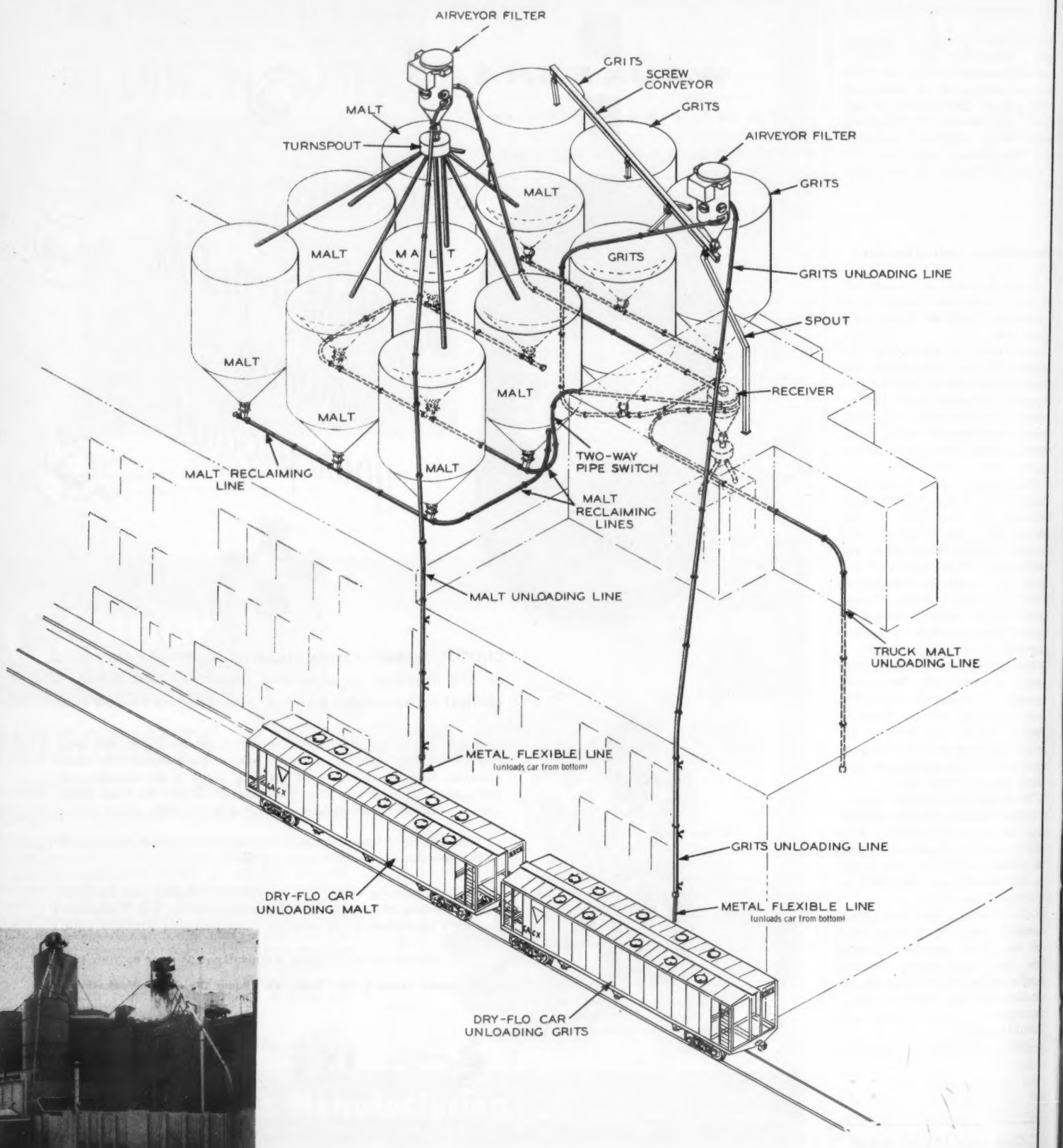
Only Waukesha offers this selectivity of design and materials plus more than 25 years of application engineering. Let Waukesha's research laboratory go to work on your pumping problem today.

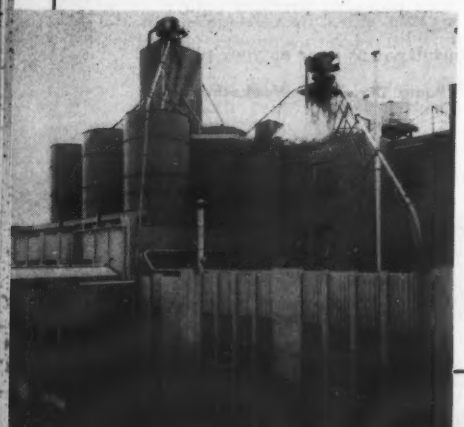
Distributors in major cities; a consultant as near as your phone.

Waukesha Foundry Co. Dept. 80 Pump Division, Waukesha, Wis.

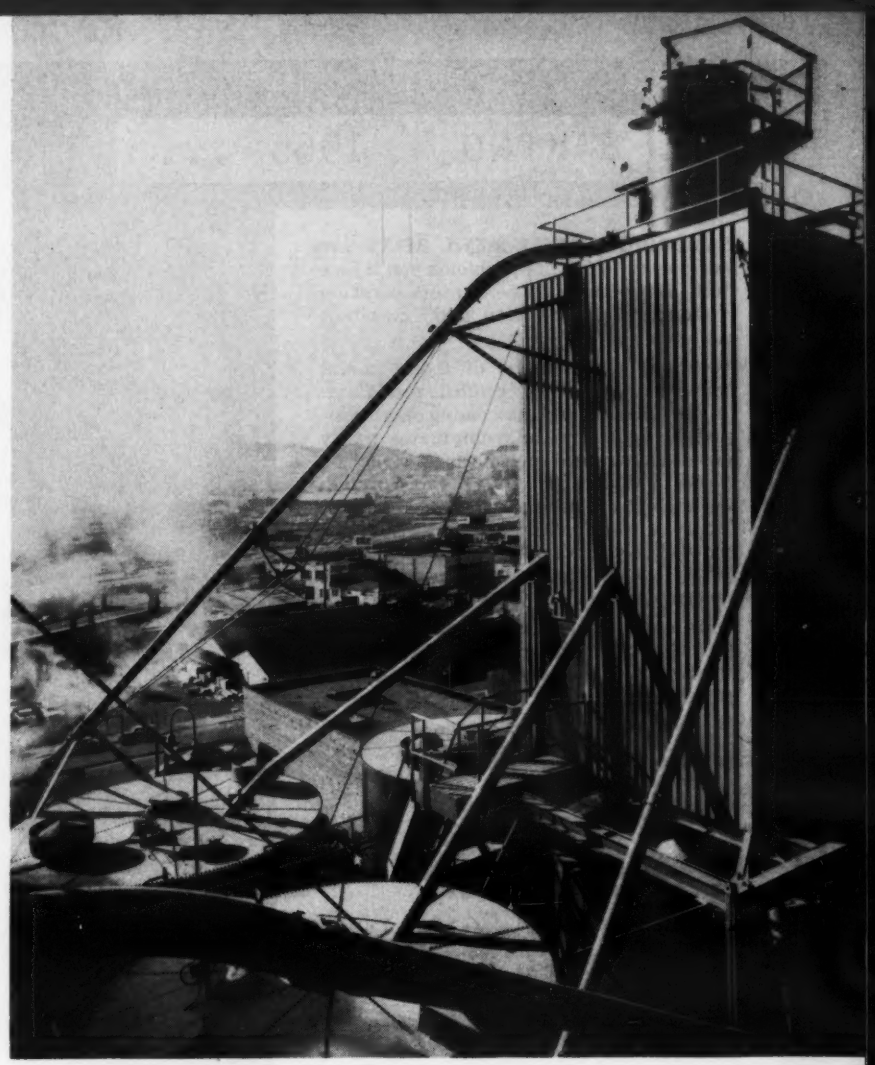


6902 on Reader Service Slip.


AIRVEYOR FILTER
GRITS
SCREW CONVEYOR
GRITS
MALT
TURNSPOUT
AIRVEYOR FILTER
GRITS
MALT
MALT
MALT
GRITS
GRITS UNLOADING LINE
SPOUT
MALT
MALT
MALT
RECEIVER
MALT
TWO-WAY PIPE SWITCH
MALT RECLAIMING LINE
MALT RECLAIMING LINES
MALT UNLOADING LINE
TRUCK MALT UNLOADING LINE
METAL FLEXIBLE LINE
(unloads car from bottom)
GRITS UNLOADING LINE
DRY-FLO CAR UNLOADING MALT
METAL FLEXIBLE LINE
(unloads car from bottom)
DRY-FLO CAR UNLOADING GRITS



◀ The two independent pneumatic systems (in color) are depicted on opposite page operating simultaneously. Larger system at left conveys malt to any one of eight bins, or directly to brewhouse. Smaller system at right conveys grits to any of four bins, or directly to brewhouse. While the screw-conveyor (top) which conveys grits from filter to storage is integral part of over-all handling system, it is not represented in color since it is not pneumatic



This unworldly-looking structure houses ▶ pneumatic system which conveys malt. Upper pipeline at left carries malt from hopper car to filter at top. From here it is sent either to storage or directly to brewhouse. Enclosed in structure is bottom portion of the Airveyor filter, a rotary feeder and a nine-way motorized turnhead

Hemmed in on all four sides, and with idle freight cars being used as 'storage bins,' burgeoning Burgermeister brewery realized 'the only way to go was UP' . . . turned to pneumatic conveying for practical way to achieve

Bulk storage in the sky

NEED FOR greatly increased storage facilities became critical at Burgermeister Brewing Corporation of San Francisco about two years ago.

Things had reached the point where freight cars, standing idle on a nearby siding, were being used for storage purposes. And, unfortunately, there was no room on any of the four sides of the plant in which to construct additional storage bins.

Once the decision was made to expand vertically, by constructing new storage bins on top of existing equipment, it became virtually mandatory — from an economic point of view — to turn to pneumatic conveying.

First step taken was to mount 12 new storage bins on roof of the brewhouse. Each Butler Bin has a capacity of either 125,000 lb of malt or up to 150,000 lb of grits. (Eight of the bins now are used for malt, four for grits.)

Two Fuller "Airveyor" pneumatic conveying systems then were engineered into the operation — one for unloading to storage and reclaiming from storage of malt; the other for conveying grits through the same operations.

Malt now is unloaded from 100,000-lb-capacity covered hopper cars in just a little over two hr. A Sutorbilt positive-displacement, vertical rotary exhauster of the lobe type, driven by a 50-hp, 1200-rpm motor, provides vacuum for this system.

Twenty-five ft of flexible metal hose, five in. in diam, is used to link the car with the six-in. conveying line permanently installed on outside of brewhouse.

This six-in. line delivers the malt to an outdoor-type, Size No. 2 Airveyor filter, five ft in diam, mounted above the bins on brewhouse roof. This filter is 115 ft above ground level. Beneath it, a 16-in. Fuller Ad-

"Airveyor" pneumatic conveying systems at Burgermeister Brewing Corp. were designed, engineered, manufactured and installed by Fuller Company, Subsid. of General American Transportation Corp., 176 Bridge St., Catasauqua, Pa.
6903 on Reader Service Slip.
Fuller Material-Level Indicators for bulk storage bins are manufactured by Fuller Company.
6904 on Reader Service Slip.
Butler Bins for bulk material storage are manufactured by Butler Manufacturing Co., 1283 Eastern Ave., Kansas City, Mo.
6905 on Reader Service Slip.

... BAKING - 1965 ...

CAMBRIDGE METAL-MESH BELTS are the answer to the big problems you'll face in the competitive 60's—tighter operating costs, higher production and consistent quality.

Continuous movement of foods, metal parts, ceramics or chemicals on Cambridge Belts through processing operations speeds production and eliminates costly manual handling. Open mesh construction allows heat, cold or liquids to flow through the belt and around the product for thorough, uniform treatment. Superior belt design and manufacturing techniques mean longer life, fewer repairs, lower operating costs.

Belts can be made heatproof, coldproof or acidproof — in any mesh, weave, metal or alloy — with any side or surface attachments.

Whether you're designing machinery for your own use, or for resale, the Cambridge Field Engineer in your area will be glad to discuss the many advantages of Cambridge Belts — from manufacturing to installation and service. Call him today. He's listed in the yellow pages under "Belting, Mechanical". Or, write for FREE 130-PAGE REFERENCE MANUAL.

The Cambridge Wire Cloth Co.
Department H • Cambridge 11, Md.

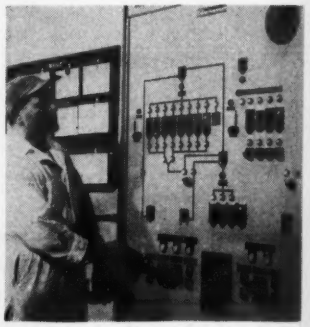
Manufacturers of Wire Cloth, Metal-Mesh Conveyor Belts, Wire Cloth Fabrications

6906 on Reader Service Slip.

justable Rotary Feeder, of cast-iron construction, serves both as a material feeder and as an air lock.

From the filter, malt is delivered by the rotary feeder to storage through a nine-way turnhead, driven by a ½-hp, 30 rpm motor. Material is thus directed, through eight-in. spouts, to any of the eight malt storage bins.

Fuller Material-Level Indicators located in each storage bin automatically signal when bin is full. An additional safety feature is an oil-actuated motion switch, driven from the feeder, which stops the exhauster motor when the feeder



Graphic control panel controls all unloading, conveying and reclaiming operations. Operator knows, by means of signal lights, exact status of each operation

is prevented from turning for any reason — such as entrance of foreign material.

Malt is reclaimed from any one of the eight storage bins to any one of three use bins in the brewhouse by a Fuller Airveyor conveying system of the vacuum type.

Beneath each of the eight storage bins a Rotary Bin Valve, driven by a ¼-hp, nine-rpm gearmotor, feeds malt into the six-in. reclaiming pipeline.

Company officials report that malt is being reclaimed by this system at 80,000 lb per hr.

To unload grits to storage bins, a second vacuum-type Airveyor system was installed. As part of this system, novel use was made of components from an Airveyor system installed in 1947.

Major element engineered

continued on page 98

Association News

National Dairy Council

Chicago, has appointed Dr. Merrill Stafford Read, director of nutrition service, replacing Dr. Zoe E. Anderson, former NDC director of nutrition research, who resigned to become head of Wayne State University's department of home economics. Dr. Read had been visiting professor, Department of Biochemistry and Nutrition, Virginia Polytechnic Institute.

Biscuit and Cracker Manufacturers' Assn.

has appointed Thomas F. Deutschle acting secretary-treasurer, replacing the recently deceased Walter Dietz. Deutschle had been a member of the public relations staff of American Bakers Assn., and will, in fact, continue to serve as merchandising manager for ABA.

California Freezers Assn.

has established two new scholarships, for $500 each. One will be awarded to a student of the Food Science and Technology Dept., University of California, Davis. The second will be awarded to a student working in processing crops at California State Polytechnic College, San Luis Obispo.

National Confectioners Association

announces appointment of G. Lloyd Latten, production vice president of McAfee Candy Co., Inc., Macon, Ga., as chairman of NCA's Research Committee. The committee considers the industry's basic research problems and needs, and makes recommendations to the Association's board of directors.

For more information on product at right, circle 6907 see information request blank opposite last page.

Towmotor backs up outstanding performance

with Towmotor dependable service

When you purchase Towmotor equipment you can be sure it will never be out of service very long . . . for two very good reasons:

1. Towmotor fork lift trucks are built to last, and built to perform continuously.
2. When needed, you get fast and skillful repair and maintenance service from your local dependable Towmotor representative.

Your Towmotor representative will never let downtime cut into the money you *save* by owning a Towmotor fork lift truck! That's why Towmotor customers keep buying Towmotor equipment. Ask for complete information on Towmotor equipment and Towmotor Preventive Maintenance Service. Write Towmotor Corporation, Cleveland 10, Ohio.

TOWMOTOR THE ONE-MAN-GANG® -GERLINGER

FORK LIFT TRUCKS, CARRIERS AND TRACTORS SINCE 1919

*Gerlinger Carrier Co. is a subsidiary of Towmotor Corporation

continued from page 96

into the new set-up was the existing 12-in. by 24-in. exhauster, driven by a 40-hp, 1200-rpm motor.

Grits are sucked up by this exhauster through a six-in. conveying duct to a second outdoor Airveyor filter — this one 93 ft above ground level. From the filter, material is gravity-fed to a 16-in. feeder, which also serves as an air lock.

Grits then proceed either directly to a use bin in the brewhouse, or else into a 65-ft-long, 12-in. helicoid screw conveyor which operates at 84 rpm, and conveys the material to any of the four grits storage bins.

For reclaiming the grits from storage, the Airveyor system incorporates variable speed drives (to accomplish blending), and delivers into the brewhouse bin at 45,000 lb per hr.

Beneath each storage bin, a Fuller Rotary Feeder of the circular flange type, driven by a one-hp, four-to-one ratio (125 to 31 rpm) variable-speed motor, determines discharge rates.

An interesting use of the original pneumatic system is the slight rerouting of part of the old unloading line so that "specialty" materials can be conveyed directly to the brewhouse without having first to go to storage.

Operating personnel report substantial savings in time as result of this innovation.

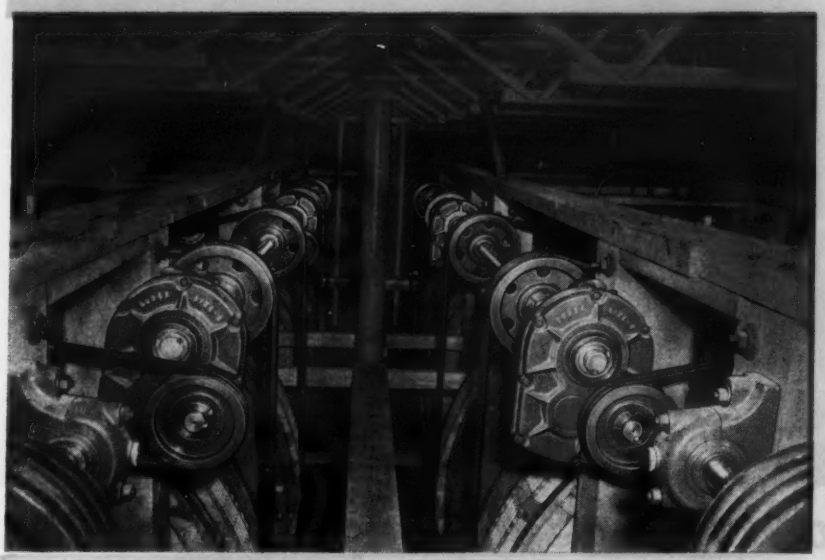
All the unloading and reclaiming operations can be controlled by one man from a Fuller graphic control panel.

END

'Primer' on selecting and using pneumatic conveyors

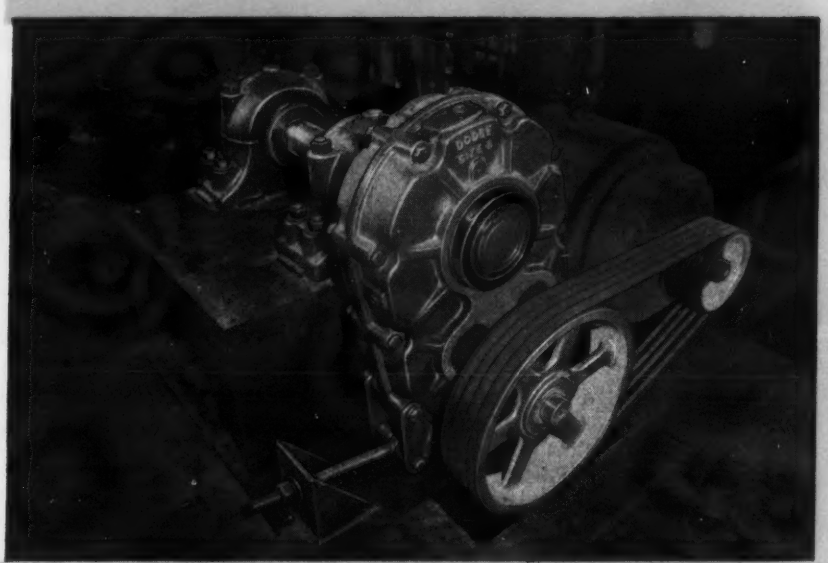
Where to use pneumatic systems, what their advantages are and the relative costs for investment, power and mechanical maintenance are considered in an illustrated eight-pg Fuller Company report — "Selection and Use of Pneumatic Conveyors" — which originally appeared in article form.

Special sections discuss what



DODGE TORQUE-ARM SHAFT MOUNTED SPEED REDUCER

Install it anywhere—with minimum time and effort. Here is an overhead installation on tanning drums. Torque-Arm reducers are resistant to acid fumes, salt water environment, moisture.



DODGE TORQUE-ARM SHAFT MOUNTED SPEED REDUCER

Can be positioned any place on the entire length of the shaft. It locks into place on *both* sides of the housing. Note modified torque arm on this installation on a mixer in a beverage plant.

The Speed Reducer Idea that

Two things account for the record popularity of Dodge Torque-Arm Speed Reducers. First, they cost less to install since they require no foundations, sliding motor rails or flexible couplings. Second—and most important—these modern reducers as developed by Dodge perform *brilliantly*. Tens of thousands of installations underscore Torque-Arm dependability. Torque-Arm is America's *quality* shaft mounted speed reducer!

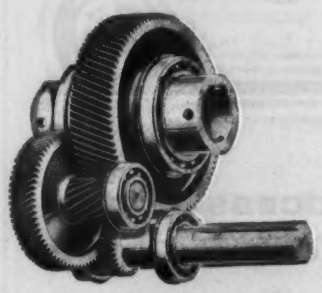
Torque-Arm has been so extensively adopted by industry that today models are available for a vast range of applications. The Torque-Arm line offers you capacities up to 170 hp—output speeds from 10 to 400 rpm—in single and double reduction series—with 5 to 1, 15 to 1 and 25 to 1 ratios. Models for vertical or inclined shaft operation are available—as well as special-application versions such as flange mounted, right

Rugged semisteel housing—
a solid backbone for solid service

Here is a tough, corrosion-resistant housing with the strength to hold bearing seats in line for the life of the unit. Perfect shaft and gear alignment are assured by doweling the matched halves together and boring in line. No gear is overhung. Loads are carried easily, contributing to Torque-Arm's long life and high efficiency—97% in double reduction models, almost 99% in single!

AGMA rated gears—
quality-guarded by continual tests

These helical gears have soft cores to withstand shock—and hardened surfaces to resist wear. Their quality is guarded in manufacture and assembly by the most modern methods of quality control, including inspection for runout, tooth spacing, helical lead and involute profile. They run quietly, mesh precisely. Teeth are crown shaved for maximum contact area. Gears are shrunk on their shafts to prevent shifting.



Modern double-lip seals
keep oil in and dirt out

Modern synthetic, double-lip seals of the highest quality keep oil in and dirt out of the reducer case. These seals offer protection for the unit from dust and dirt and just as effectively insure cleanliness when operating in laundries, textile mills, food processing plants.

Re-ally Clicked!

angle and extended input shaft styles. Optional equipment includes a positive, sealed-in backstop and a positive overload release.

Ask your local Dodge Distributor. Or write us for our 64-page Torque-Arm Speed Reducer Bulletin, complete with engineering data and easy selection tables.

DODGE MANUFACTURING CORPORATION
2400 Union Street • Mishawaka, Indiana

DODGE
of Mishawaka, Ind.

CALL THE TRANSMISSIONEER — your local Dodge Distributor. Factory trained by Dodge, he can give you valuable help on new, cost-saving methods. Look under "Dodge Transmissioneer" in the *white* pages of your telephone directory, or in the yellow pages under "Power Transmission Machinery."

6908 on Reader Service Slip.

the three basic systems are, basic elements of each system, various component parts, types of conveying lines, valves, indicators and controls.

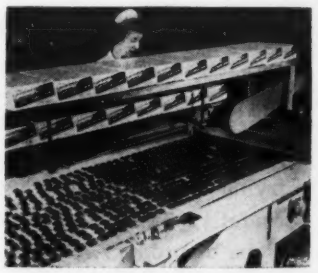
Of particular interest is a listing of materials which can be handled pneumatically.

6909 on Reader Service Slip.

Plastic belt proves mettle carrying baked food, candy

Now used by more than 100 companies in the candy, baking and other food processing fields, Permagloss conveyor belt is described as the first 100 per cent plastic belt offered to industry.

Made by joining two sheets of Du Pont's "Mylar" polyester film with a special adhesive, the belting has proved strong, smooth, flexible, crackproof, non-absorbent, immune to attack by oils and greases, stable under temperature and humidity changes and possessed of good heat-transfer properties.



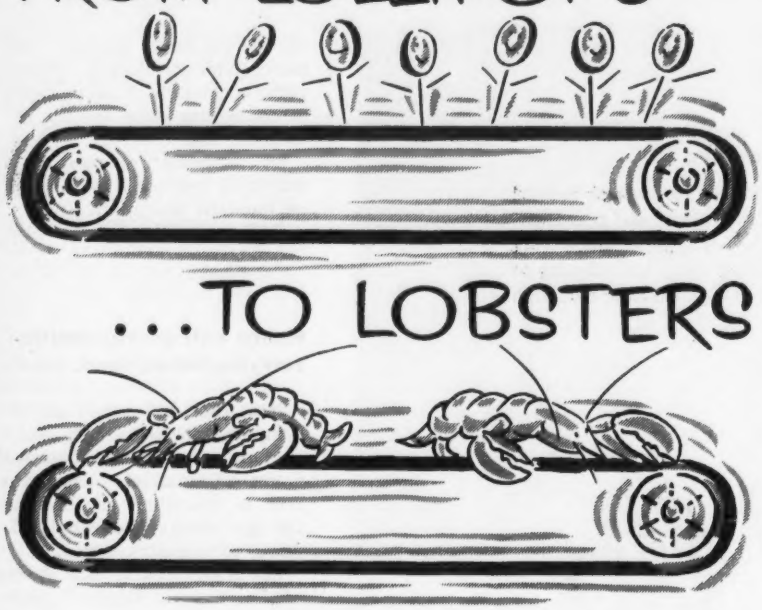
Belt is easily cleaned, and does not support bacteria growth. Scraping does not affect smooth finish of Mylar carrying surface

Moreover, because of its simple design, Permagloss belting can be obtained at considerably less cost than other belting materials.

Super-smooth surface of belt has been especially valuable in conveying chocolate-covered candy and baked foods products. Besides imparting a glossy appearance to the bottom coating of the item, belt's excellent release characteristics speed up production and minimize rejects.

Easily installed by the processor, Permagloss belting can

FROM LOLLIPOPS ...TO LOBSTERS



You can depend on

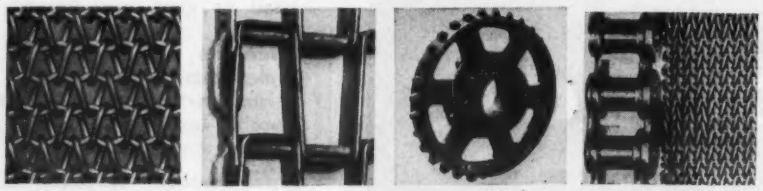
ASHWORTH METAL PROCESS BELTS

To carry the load.

When you have the problem of continuous product flow through processing . . . whether that processing be canning, freezing, deep frying, baking or packing . . . you can depend on an Ashworth Metal Process Belt to convey your product safely, economically. Type of product offers no problem when you specify Ashworth Metal Process Belts . . . meat, poultry, sea food, fruit or produce all ride in style.

Ashworth Metal Process Belts meet every demand of sanitation, heat, corrosion, drainage or direction of flow (Patented Ashworth Omniflex Belts even go around corners.)

Engineering versatility plus the finest plant facilities in the industry insure quality woven into every Ashworth Belt.



Write direct for technical literature covering the complete family of Ashworth Belts. No obligation, of course.

ASHWORTH BROS., INC.

WINCHESTER, VIRGINIA

Sales Offices in Principal Cities

6910 on Reader Service Slip.

be laminated by adhering the two ends of the five-mil sheets left open for that purpose.

When installed, belt is fitted exactly to the conveyor, and the two dove-tailed ends are sealed with adhesive and a heat-seal iron.

Low weight of 0.15 lb per sq ft makes Permagloss belting only 1/12 as heavy as the lightest woven material — requiring less driving power, and reducing strain on machinery.

Supplier: Lassiter Corp., 350 Fifth Ave., New York 1, N.Y.

6911 on Reader Service Slip.

Hydraulic lift platform 'bridges' split floor levels

Designed to speed movement of hand-trucks and dollies inside plants with split-floor areas, 500-lb-capacity hydraulic-platform lift rises to a maximum height of three ft.

Unit consists of an oil-hydraulic ram, electric motor-driven oil pump, oil reservoir, platform and platform-supporting structure.

Pushbutton control station may be located anywhere, for convenience of operator

The four-by-six-ft checkered, steel-surfaced platform is "suspended" from plunger top of hydraulic ram. Two upright supporting members attached to the crosshead operate inside guide channels to stabilize the rising and lowering action of platform.

All components are mounted on a base plate which is simply bolt-anchored to floor; no ground excavation is needed.

Supplier: Globe Hoist Co., E. Mermaid Lane at Queen St., Philadelphia 18, Pa.

6912 on Reader Service Slip.

Look in the **YELLOW PAGES**

Call your nearest

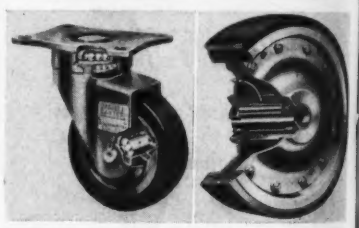
DARNELL DISTRIBUTOR

ASK FOR THIS NEW FREE HANDBOOK GIVES THE FACTS

about

DARNELL

CASTERS & WHEELS



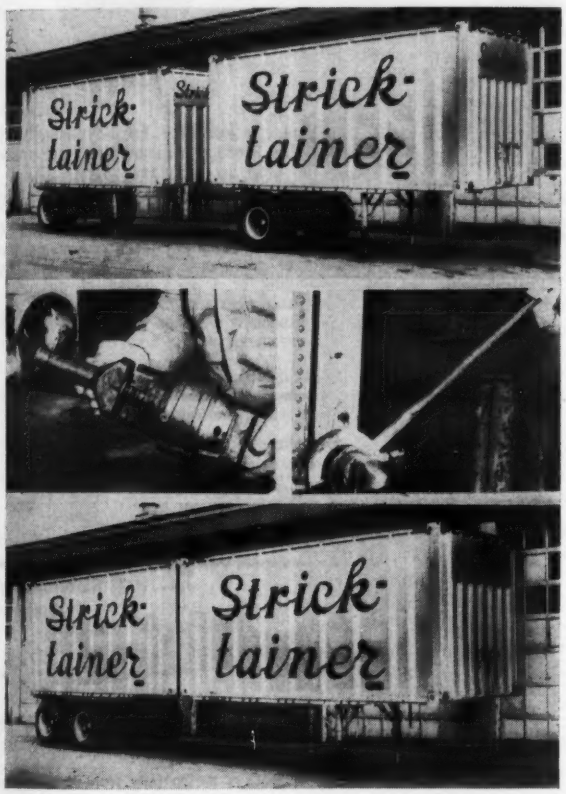
Featuring Darnelloprene treads - a soft, resilient Neoprene rubber compound that has superior qualities in resistance to oils, waxes, most chemicals and oxidation - these casters offer ease of movement, quietness and protection for floors.

DARNELL CORPORATION, LTD.

DOWNEY (Los Angeles County) CALIF
37-28 SIXTY-FIRST, WOODSIDE 77, L.I., N.Y.
36 NORTH CLINTON ST., CHICAGO 6, ILL.
1000 PEACHTREE N. E., ATLANTA, GA.

6913 on Reader Service Slip.

Basis of system's flexibility is inter-locking arrangement by which two Strick-Tainers may be quickly coupled together (top to bottom, below), or uncoupled. Sockets into which connecting pins lock (see center photos) are located at bottom of fore and aft ends of box. Top two sockets on each end accommodate spacer bars. Joining is a one-man operation — using the tractor's power and braking system and the Strick-Tainer's runner arrangement which accommodates the sliding axle



Versatile 20-ft 'boxes'

Ease freight delivery via road, rail or sea

- **Single mount for city delivery**
- **Tandem mount for cross-country**

Based on a 20-ft-long "box" unit, new "Strick-Tainer" containerized freight-handling system offers great flexibility in choice of carriers and in routing of LTL loads.

For city delivery, container is placed on a flatbed truck, or mounted over a single axle to form a 20-ft semi-trailer.

For over-the-road use, two Strick-Tainers may be coupled together to form a 40-ft tandem-semi — mounted over two single-axles at rear of the combination, and tractor's fifth wheel at front end.

Or, a long flatbed truck can

NIAGARA "no frost"

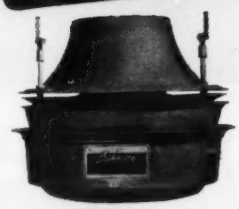
THE BEST OPERATION IN FROZEN FOODS

● Niagara "No Frost" lifts the penalty that icing puts on large operations in freezing foods or warehousing them. It gives you all the benefits of continuous production with FULLY automatic refrigeration and protects you from losses of valuable perishables by assuring you always full capacity from your refrigeration plant and your operation running smoothly when you need it most... during peak loads. You save labor and power and get lower cost figures both in operation and upkeep. You can get a plant design that is efficient.

Write for Bulletin No. 105

NIAGARA BLOWER COMPANY
Dept. FP-11, 405 Lexington Ave., New York 17, N. Y.
District Engineers in Principal Cities
6914 on Reader Service Slip.

Bahnson WATER or STEAM UNIT HUMIDIFIERS



TYPE E

prevent spoilage, dehydration, costly processing and storage problems with

LOW-COST HUMIDITY CONTROL

- Guaranteed, self-contained water or steam units have low first cost, low operating cost.
- Automatic controls.
- Easy to install; need only water or steam supply, drain, electrical connection.

FREE BOOKLET

Send for your free catalog. Details, illustrates full line of 14 humidifiers to fit every need, any size area. Clip coupon to letterhead and mail.

NAME_____

THE BAHNSON COMPANY
WINSTON-SALEM, N. C.
F-8-N

6915 on Reader Service Slip.

be turned into an over-the-road dromedary tractor, carrying one 20-ft box and pulling two 20's made up as a 40-ft semi.

By rail, Strick-Tainers load quickly — four to a car — on Flexi-Van cars or regular flatbed cars using conventional hitches. Boxes may either be slid on, or, if mounted, driven on wheels and all.

By sea, Strick-Tainer units may be stowed above or below decks, using conventional or special loading devices. Containers can be nested vertically without additional equipment. They will hold up under a 30-degree tilt, without special lashing or tie-downs.

"Strick-Tainer" container system is development of Strick Trailers, Div. of Fruehauf Trailer Co., P.O. Box 5037, Philadelphia 11, Pennsylvania.

6917 on Reader Service Slip.

Typical application which demonstrates the Strick-Tainer's flexibility of interchange might involve two 40-ft container loads sent out from two Midwest cities, and consisting, in each instance, of one 20-ft container for Boston and another 20-ft container for Baltimore.

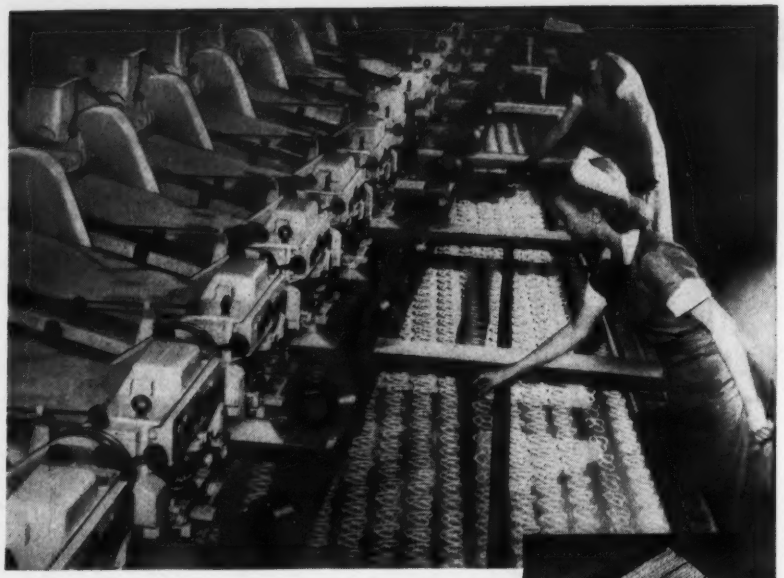
At a common break-bulk point en route, the loads could be disassembled and then reassembled as "integrated" 40-ft loads for Boston and Baltimore, respectively.

Throughout this operation — from point-of-origin to final destination — only two tractors (and drivers) need be involved, providing obvious economies. END

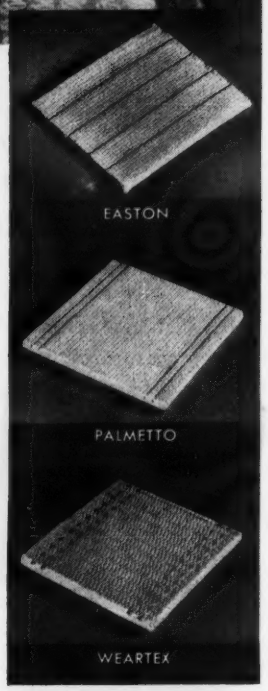
See Page 125

for handy, classified listing of new technical literature

- Equipment
- Ingredients
- Supplies



Only Victor Offers Food Processors These 3 Styles of Solid Woven Belting



Conveying? Elevating? Special Applications? Wherever the job calls for solid woven belting, you can specify the right kind—every time—if it's Victor. And there are *3* styles to choose from:

EASTON... for general purpose light conveying. Woven of the finest long staple virgin cotton with an exclusive Innerbound construction that effectively prevents ply separation.

PALMETTO...its smooth surface won't mar or mark soft confections or baked goods. Innerbound... with extra threads in the warp and filling that eliminates buckling.

WEARTEX...stronger than conventional solid woven belting because it's Interwoven under extreme tension, rugged heavy-duty Weartex never fluffs or peels as it wears down gradually and evenly.

Only Victor offers you three styles of solid woven belting to choose from... in a wide range of widths, plies, thickness and protective finishes. Write today for circulars containing complete specifications and prices of Victor's famous brands of Solid Woven Belting for the food industry. 1499

A COMPLETE LINE, including: Neoprene Belting • Solid Woven Belting—untreated, impregnated, coated—many widths and plies • Canvas Stitched Belting • Hycar Belting • Belting Specialties.

50th ANNIVERSARY 1910-1960

Victor Balata & Textile Belting Co.

53 Park Place, New York 7 • 300 306 W. Hubbard Street, Chicago 10

Factory, Easton, Pa

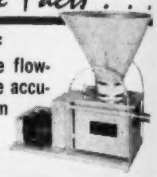
6916 on Reader Service Slip.

Unmatched ACCURACY with Vibra-Screw Bulk Feeders

Minute by minute... hour by hour... VIBRA-SCREW Feeders precisely feed dry materials with unerring accuracy. VIBRA-SCREW Bulk Feeders combine a vibrating screw rotation with a vibrating hopper, trough and tube. This exclusive new feature, offered in three styles, standard volumetric, feeder conveyor volumetric or gravimetric, now permits the positive handling of a wide range of different and difficult substances. Each VIBRA-SCREW unit is especially designed to meet specific feeding requirements.

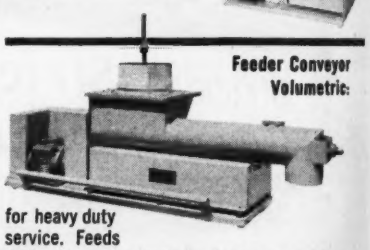
Consider These Facts . . .

Standard Volumetric:



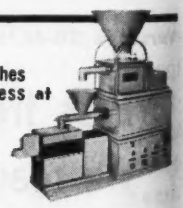
handles all materials, free flowing or sticky with complete accuracy. Capacity ranges from ounces to tons per hour.

Feeder Conveyor Volumetric:



for heavy duty service. Feeds and conveys horizontally from supply pipe or hopper. Tonnage rates with screw lengths up to 15 feet.

Gravimetric:



delivers weighed batches directly into process at timed intervals. Handles quantities down to one ounce with variable frequencies up to 4 per minute. Intermittent charges are easily converted into a self-adjusting, continuous weight-controlled stream by using a continuously rotating and vibrating third screw.

Write Today **. . . for more information and interesting literature including valuable engineering data. We invite your inquiries . . . just send us the details of your dry materials handling problem.**

Vibra-screw FEEDERS, INC.

156 Huron Avenue / Clifton, New Jersey

6918 on Reader Service Slip.

Offer aids to safer lift truck operations

Plant safety kit aimed at making material handling operations safer and more efficient in production, storage and shipping areas — by reminding workers of correct operating procedures related to use of lift trucks — again is being released by Towmotor Corporation.

Complete kit contains a pocket-sized Lift Truck Operator's Guide, four humorous safety cartoons for posting on plant bulletin boards and four large lift truck route posters printed in bold letters on a bright background.

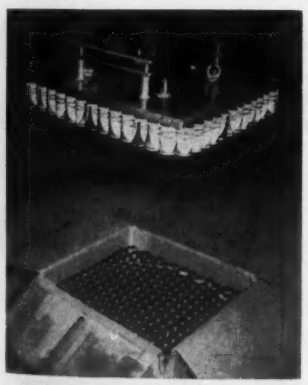
Each of latter, in addition to warning plant "pedestrians" of lift truck traffic in the area, displays a different message of caution to the truck operator regarding narrow aisles, blind corners, dangerous crossings and low headroom areas.

6919 on Reader Service Slip.

Can-lifter magnet speeds handling

Uses: New Indox can-lifter magnet has proved highly useful in removing cans from cartons and placing them on conveyor belts for further processing.

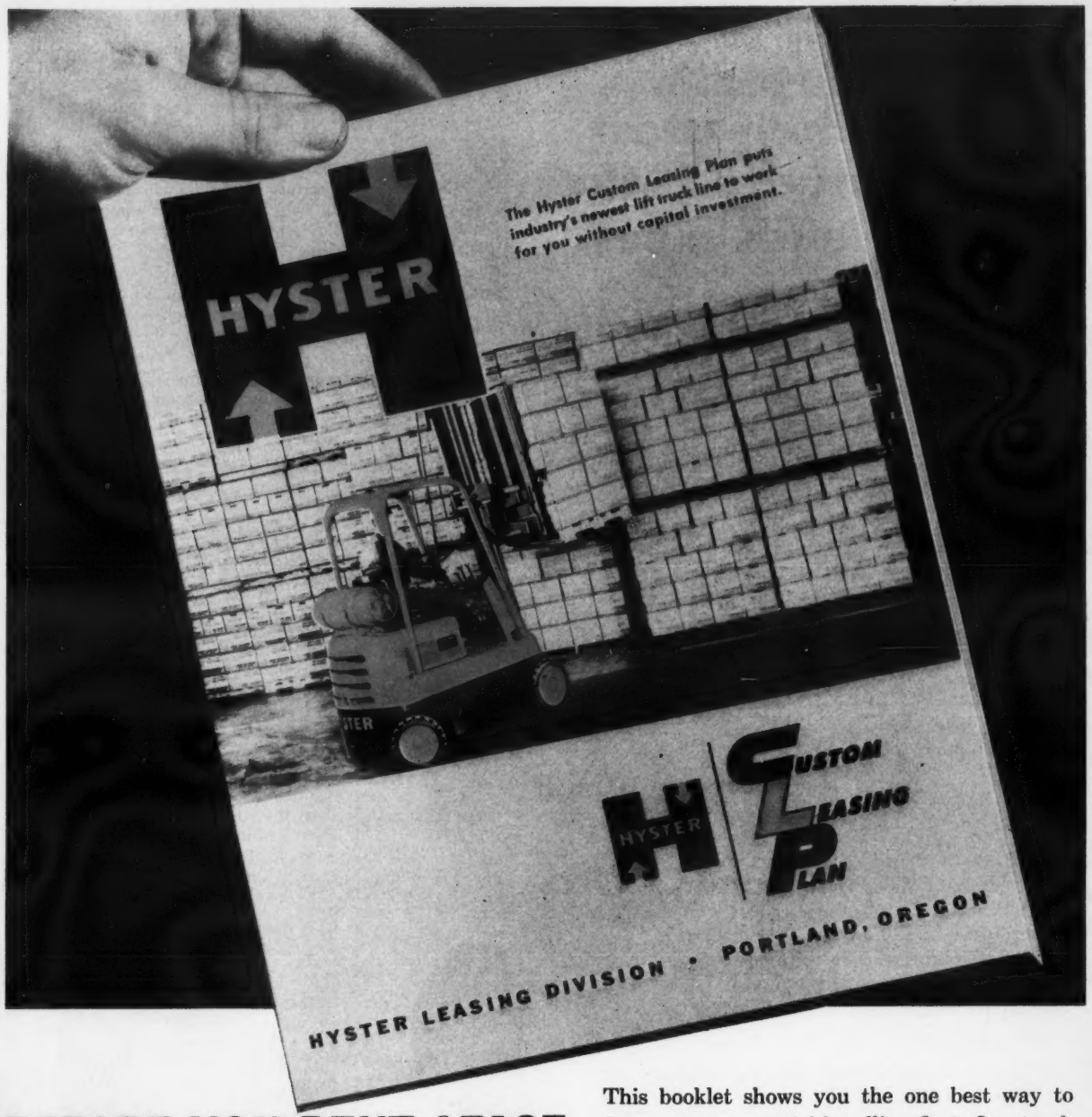
Features: Use of ceramic permanent magnets eliminates



Magnet shown (handling battery cases) measures 18 x 20 in.

electrical expense, coil failure, power failure danger and maintenance cost.

Description: A manual dis-


HYSTER
The Hyster Custom Leasing Plan puts industry's newest lift truck line to work for you without capital investment.
HYSTER
CUSTOM LEASING PLAN
HYSTER LEASING DIVISION • PORTLAND, OREGON

BEFORE YOU RENT, LEASE OR BUY ANY LIFT TRUCK...

Read this Booklet!

This booklet shows you the one best way to finance your material handling fleet. One truck or 50 trucks—one day or 5 years—this Custom Leasing Plan fits your exact requirements.

Now you can get industry's newest lift trucks without capital investment—eliminate maintenance problems, and realistically budget your handling costs.

Get this booklet and full details from your Hyster Dealer, or write . . .

INDUSTRIAL TRUCK DIVISION—Lift trucks, mobile cranes, straddle carriers
TRACTOR EQUIPMENT DIVISION—Construction and logging equipment
MARTIN TRAILER DIVISION—Heavy machinery hauling trailers
INTERNATIONAL DIVISION—Overseas manufacturing, sales and service
Factories: Portland, Oregon (Home Office) • Danville, Ill. • Peoria, Ill. • Kewanee, Ill. • Nijmegen, The Netherlands • Irvine, Scotland • Sao Paulo, Brazil • Sydney, Australia (Licensee)

HYSTER COMPANY
HYSTER LEASING DIVISION
P. O. Box 4318 • Portland 8, Oregon

charge mechanism easily releases the load. Operator simply presses a pair of handles which, in turn, push a stainless steel cover plate away from face of magnet. Load is then forced out of magnetic field and released from the unit.

Magnet is available in number of sizes and shapes to conform to various sizes of containers, conveyor belts, etc., and with various types of release mechanisms.

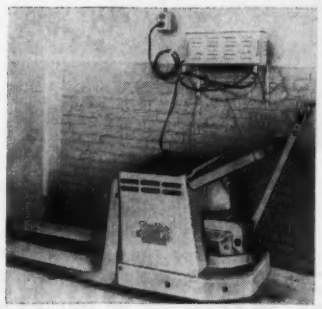
Supplier: Stearns Magnetic Products, 635 S. 28th St., Milwaukee 46, Wis.

6921 on Reader Service Slip.

Low-cost shelf bracket boosts charger's usefulness

A shelf bracket costing just $2.50 greatly increases the usefulness and versatility of Exide Power Mount silicon-rectifier battery chargers.

Instead of being mounted on the tray cover of the industrial hand-truck battery — where it would be used to charge just the one battery — the Power Mount now can be used



Shelf bracket shown, available at many hardware stores, is a heavy-duty type with hooks convenient for hanging up charging cable

to charge or boost-charge several batteries successively.

Having ample capacity to do this, the high-capacity charger also can be used with complete safety on a lower-capacity battery to achieve increased battery-charging speed.

Depending upon model to be mounted, bracket should be capable of holding the follow-

Clipper

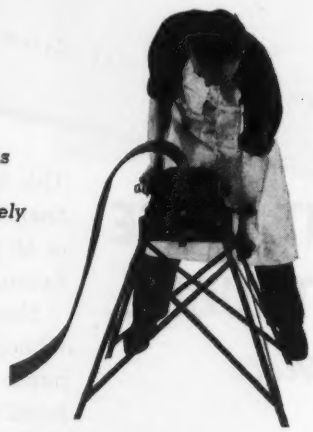
HOOKS and LACERS

in materials handling, food harvesting and processing, power transmission, wherever flat ends must be joined. Clipper belt lacing equipment for belts, aprons, tapes and ribbons!

- *produces secure, flexible joints in minutes*
- *does not injure belting*
- *gives smooth, flexible joint that rides freely over conveyor rollers*
- *is flexible both ways of the belt*

WRITE FOR FREE SAMPLE

Send a sample of your belting, apron or ribbon to Clipper with an outline of your problem. They'll determine the best method of fastening and then lace your sample FREE.



Ask your Industrial Distributor for Clipper Products

Clipper BELT LACER COMPANY

972 Front Ave., N. W., Grand Rapids 2, Michigan

6920 on Reader Service Slip.

SANDVIK

STEEL BELT CONVEYORS

Give Clean, Efficient Performance

in more and more food processing applications

- EASY CLEANABILITY
  Boiling water or live steam can be applied directly to solid stainless belt.
- LOW FRICTION SURFACE
  Easier slide handling and discharge.
- HIGH STRENGTH
  Greater capacity and service life.
- HIGH HEAT TRANSFER CAPACITY
  Efficient freezing, cooling or heating.

Write for booklet E 738.

SANDVIK STEEL, INC.
Steel Belt Conveyor Dept.
1702 Nevins Road, Fair Lawn, N. J.

Cleveland
Detroit
Chicago
Los Angeles

In Canada:
Sandvik Canadian Ltd.
P. O. Drawer 1335
Mont. S. P. Q.

SANDVIK STEEL BELT CONVEYORS

6922 on Reader Service Slip.

Another first from Standard Conveyor

New continuous vertical conveyor revolutionizes floor-to-floor movement

Escaveyor self-loads, self-unloads, lifts products straight up or down without tipping or jarring. Provides smooth up, down, or reversible service.*

How Escaveyor speeds production. Here is the answer to your big need for a fast, continuous flow of commodities from floor to floor. Escaveyor moves commodities at a steady rate of 8 to 10 loads per minute.

How Escaveyor saves space. Escaveyor lifts packaged or unit commodities rapidly from floor to floor with the continuity of a belt conveyor. Yet your product always rides level. And look at the huge saving in space! It takes even less floor space than a conventional monostrand or straight-lift conveyor! Escaveyor's size is tailored to fit your package.

How Escaveyor costs less. Escaveyor actually costs less to purchase and install than practically any other type of lift. It requires less manpower because no manual loading or unloading is required. You also save many square feet of valuable floor space.

Free brochure. Send for free Escaveyor brochure! It tells how Escaveyor works, and how it can solve vertical material handling problems for *you!* Get your copy from Standard Conveyor Company, Dept. Q-11, North St. Paul 9, Minnesota, or from your nearby Standard Conveyor sales representative.

*patent pending

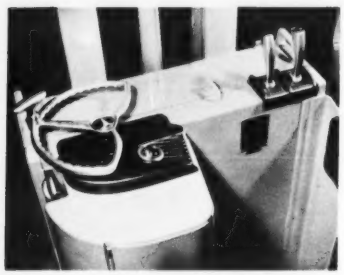
Standard Conveyor

Sales and Service in over 40 Cities
Consult your Yellow Pages

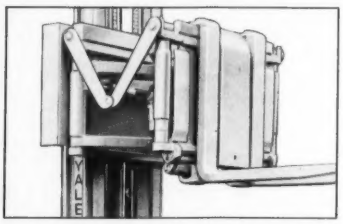
6923 on Reader Service Slip.

save space
you can't afford to waste

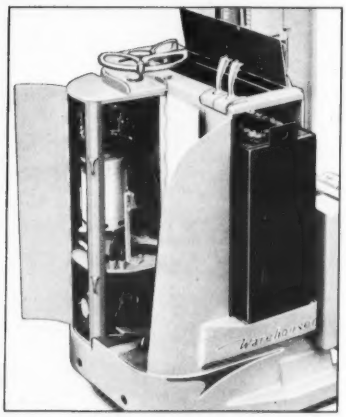
YALE WAREHOUSERS



Control grouping saves time by permitting operator to lift or lower while travelling. Direction indicator in steering wheel hub shows drive wheel direction, saves effort in cramped quarters, prevents stalling. Hour meter checks operating time, ton-hour handling costs, permits maintenance based on running time.



An exclusive separate motor and hydraulic system in the Extend-A-Load for fork extension and tilt increases efficiency . . . saving power. Unitized design gives maximum maintenance accessibility. Exclusive, interlocking I-beam mast gives greater strength and stability. Mast and carriage ride on large ball-bearing rollers.



Operational maintenance is easier. Maximum accessibility to components without sacrifice of chassis strength and rigidity. Immediate access to battery for inspection. Easy battery removal.

• Get more pallet rows in the same space • Can work in a 6 ft. aisle • Stack to 20 feet and more • Save on low maintenance • Reduce power costs • 2000, 3000, 4000 lb. capacity.

You get greater power in less space with the 24-volt Yale Warehouser. More efficient use of power for increased work capacity. Faster lift and sustained high-speed travel.

The Yale Extend-A-Load model handles various widths of loads because different size pallets and skid bins can be handled without nesting between outriggers. Maintenance is easier and power is conserved by Yale's exclusive separate power unit for fork extension. Extend-retract device designed for low overall height to prevent robbing you of valuable space in high stacking. Forks can be tilted back to 6 degrees to protect load and speed operations. They can be extended, retracted or tilted at any height of lift. Twin tilt cylinders eliminate sway of forks—provide load stability.

Start saving now. Yale has a finance plan that will put this truck to work for you immediately. For more information, contact your Yale Representative, or write to: The Yale & Towne Manufacturing Company, Materials Handling Division, Philadelphia 15, Pa. Dept. R-005.

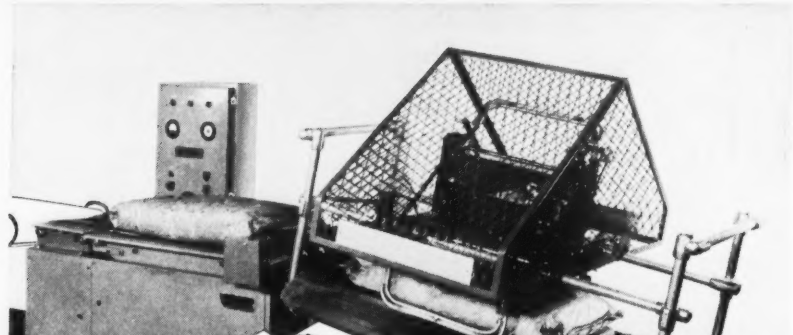
Yale Materials Handling Division, a division of The Yale & Towne Manufacturing Company. Manufacturing Plants: Philadelphia, Pa., Forrest City, Ark. Products: Gasoline, Electric, Diesel, and LP-Gas Industrial Lift Trucks • Worksavers • Warehousers • Hand Trucks • Industrial Tractor Shovels • Hand, Air, and Electric Hoists

YALE®

INDUSTRIAL LIFT TRUCKS
TRACTOR SHOVELS · HOISTS

YALE & TOWNE

Save space where space costs most—cold storage operations. How much does your space cost?



SELECTROL® checkweighs bags with 1/10 of 1% accuracy

...with rate of speed at twenty 50-pound bags per minute...

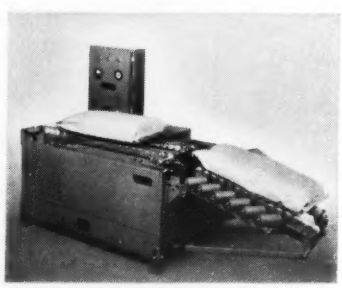
Model 1250 Selectrol, designed for installation in a production line, checkweighs bags from 25 to 150 pounds in motion... and detects weight variations as small as 1½ ounces or less per 100 pounds. Speed is variable — up to 25 bags per minute, depending on size and weight. Tolerance is adjustable to your requirements.

The Selectrol shown above has automatic overweight and underweight rejection mechanism. Models are available with underweight rejection only or without rejection mechanism. All electrical parts are fully protected against dust and oil.

Optional equipment includes: recorders, counters, visual and audible signaling devices and special control accessories to your requirements.

Selectrols are made by Exact Weight, a leading manufacturer of job-engineered scales for 45 years with experience gained through hundreds of checkweighing installations.

WRITE FOR BULLETIN 3376



Selectrol Bag Checkweigher shown above without rejector mechanism

Selectrol Case and Carton Checkweigher with rejector mechanism. Acceptable weights continue in a straight line; over and under weight cartons are diverted off the line.

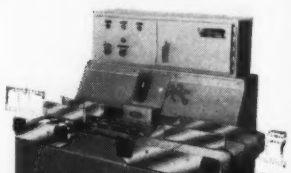
Exact Weight SCALES

THE EXACT WEIGHT SCALE CO.
909 W. FIFTH AVE., COLUMBUS 8, OHIO
In Canada: 5 Six Points Road, Toronto 18, Ont.

Sales and Service Coast to Coast

Find us in your local 'Yellow Pages'

OTHER EXACT WEIGHT EQUIPMENT



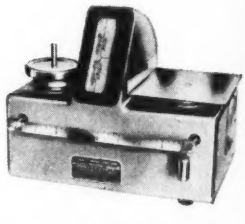
MODEL 1206 SELECTROL

AUTOMATIC CHECK-WEIGHERS

Weighs, classifies and sorts products or packages into overweight, underweight and correct weight groups. Handles up to 120 items per minute with accuracies of 2/10 of one percent of product weight. Sorts open or closed packages. Write for Bulletin 3377.

NET WEIGHING MACHINES

Automatic net weighing machines for packaging, bagging, batching, compounding and for feeding dry, free-flowing materials. Models with capacities from 3 lbs. to 100 lbs. Also semi-automatic models. Write for Bulletin 3318.



SHADOGRAPH® SCALES

Extremely fast with a high degree of visible accuracy for use in all kinds of repetitive production weighing operations. Available in 35 models in capacities from 2000 milligrams to 100 pounds. Write for Bulletin 3333.

6924 on Reader Service Slip.

ing: Model PMR-6-360, weighing 65 lb and measuring 22 1/16 by 6 9/16 in.; Model PMR-6-450, 85 lb and 22 1/16 by 6 9/16 in.; Model PMR-6-660, 125 lb and 23⅛ by 7⅜ in.

Power Mounts, which operate from any 115-V AC outlet, have transistor "brain" units for automatic and precise maintenance of proper charge rates from beginning to end of charging cycles.

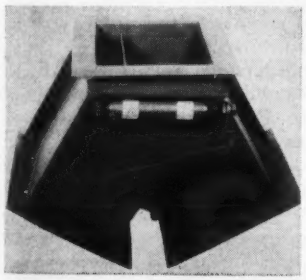
Supplier: Exide Industrial Div., the Electric Storage Battery Company, Rising Sun & Adams Aves., P.O. Box 8109, Philadelphia 1, Pennsylvania.

6925 on Reader Service Slip.

Divert bulk materials from one direction to another

New line of bifurcating gates features one removable side for easy cleaning.

Standard size range is from six to 16 in., manufactured in



Movement of gate is by tilt bar for hand operation, or by air cylinder (as above)

stainless, galvanized or carbon steel.

The flop gate shaft rides in self-aligning bronze bearings which can be mounted outboard, with inboard mechanical seals or stuffing boxes where required.

Supplier: The Bucket Elevator Company, 360 Springfield Avenue, Summit, New Jersey.

6926 on Reader Service Slip.

For more information on preceding spread, circle 6927 . . . see information request blank opposite last page.

"We dry our vegetables 84% faster on USS Cyclone Conveyor Belts"

"Our USS Cyclone belt dryer does in one hour what conventional tray dryers do in six," says Mr. W. B. Bannon, vice-president, California Vegetable Concentrates, Inc., Modesto, California. "Each machine removes 1000 to 1200 pounds of water from our vegetables every hour – without handling, loading and unloading individual trays.

"Our first Cyclone dryer belt is still giving us good service after five years. Two seasons after we put it in, we purchased five more—also going strong. These six belts handle approximately 50% of the products produced in one of our Modesto Plants. The principal advantages of the belt dryer are: rapid and uniform drying, deeper color, and reduction of total bacteria count."

Your plant can earn larger profits in a shorter time with a USS Cyclone Conveyor Belt. The belts are flexible, porous and sanitary. Cyclone Conveyor Belts can be fabricated from any ductile metal suitable for your processing operation from sub-zero freezing through the high temperature range, whichever the operation may require. Send for our free booklet today.

USS and Cyclone are registered trademarks

This mark tells you a product is made of modern, dependable Steel.

American Steel & Wire Division of United States Steel

Cyclone sales offices coast to coast

American Steel & Wire
Dept. 0438, 614 Superior Ave., N.W.
Cleveland 13, Ohio

Please send me your free booklet on USS Cyclone Conveyor Belts.

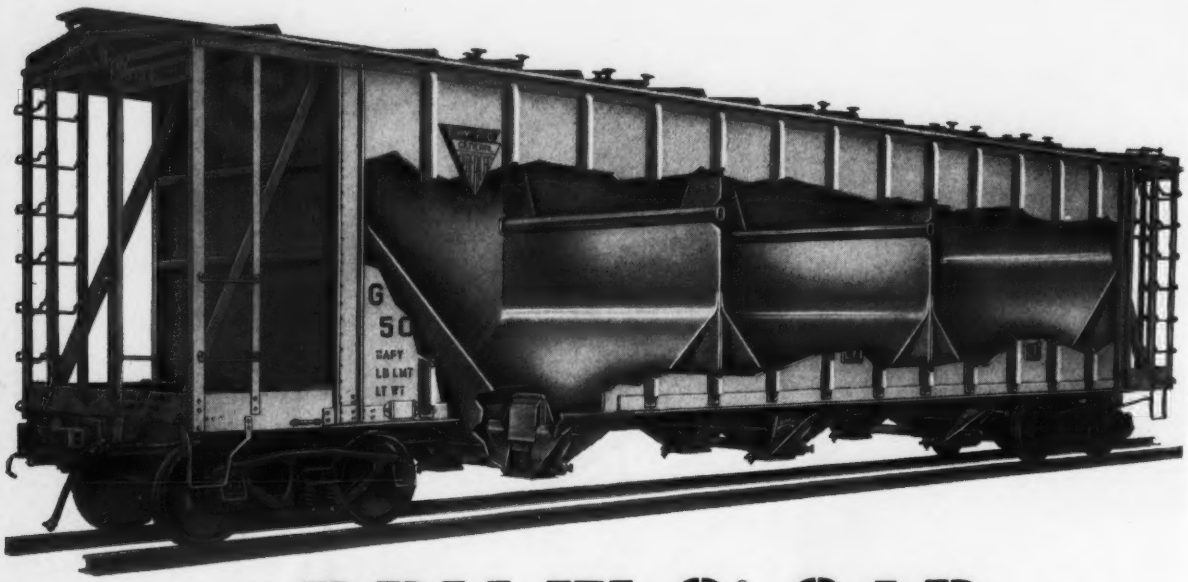
Name_____

Address_____

City_____ Zone_____ State_____

6928 on Reader Service Slip.

Ship Chemicals, Food Stuffs, Feed Ingredients in bulk in the New



DRY-FLO® CAR

General American's new Dry-Flo car brings the economies of bulk shipment to many dry, granular or powdered products which otherwise require bags, drums or containers.

Competitive in price with ordinary covered-hopper cars, the Dry-Flo car keeps the lading contamination-free and seals it from the outside air.

The Dry-Flo car can be loaded easily and quickly by either pneumatic or mechanical systems. Rounded hopper corners and clean interior lines eliminate hang-up points, insure complete discharge of product. Interiors can be coated.

All this adds up to important savings for shippers.

Consult us about *your* shipping problems. If you make, buy or sell dry, granular products, chances are you will profit from shipping by Dry-Flo car.

•Patent Rights Reserved

IT PAYS TO PLAN WITH GENERAL AMERICAN

Airslide® and Dry-Flo® Car Division
GENERAL AMERICAN TRANSPORTATION CORPORATION
135 South La Salle Street • Chicago 3, Illinois
Offices in principal cities
In Canada: Canadian General Transit Co., Ltd., Montreal

DRY-FLO GENERAL AMERICAN TRADE MARK

6929 on Reader Service Slip.

Special handling problem —special truck or standard?

What causes users with special handling problems to resort to special-type lift trucks? What are conditions favoring purchase of less costly standard equipment? What other factors should be considered before making a final decision?

Facts contained in Automatic Transportation Company's new eight-page brochure, "Standards vs Specials," should aid material handling engineers faced with an "either-or" decision.

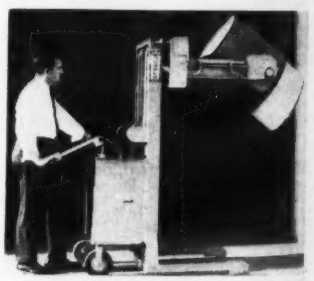
Five pages of illustrations show how both types of truck currently are used by industry.

6930 on Reader Service Slip.

Dumps drums from any point in lifting range

Features: Variable-height dumping feature of new Tu-bar Drum Dumper cuts equipment investment costs by allowing use of one unit to feed receiving hoppers of various heights.

Description: New hydraulic grab with suction cupped rubber pads securely holds drum in every position. Hydraulic turning device furnishes clean, fast pouring of liquids — or it can pour slowly or be quickly stopped and reversed for partial pours. One push-button controls all movements.



All models rotate drum 180 degrees at any point in the lifting range

Dumpers can be completely

continued on page 112

Plants, Companies, Personalities

Preservaline Mfg. Co.

Flemington, N.J., has appointed as director of research and development Dr. Hugo Eryk Wistreich, most recently research director for Reliable Packing Co., Chicago. While with Reliable, he worked on analytical techniques for the meat packing industry, and was responsible for development of new products.

Seeman Brothers, Inc.

New York City, which in May 1959 acquired over 70 per cent of the voting stock of Seabrook Farms Company, will officially merge with the latter following a special Seabrook stockholders meeting on October 13. Consolidation of operations will enable Seeman, a diversified wholesale grocery concern established in 1886, to effect substantial economies in billing, collection and distribution.

North Pacific Canners & Packers, Inc.

is constructing a frozen and canned research and development facility at the six-packer group's headquarters address, 5200 S. E. McLoughlin Blvd., Portland, Ore. Besides a fully equipped laboratory, the center will have a specially built pilot plant with heat processing and freezing equipment — including high-vacuum equipment. William F. Filz, technical director, will be in charge of the center.

Seymour Foods Inc.

Topeka, Kans., has appointed Mrs. Irene Phillips home economist. Working in Seymour's test kitchen, under direction of Technical Director James M. Gorman, she will conduct research in development of new egg products.

For more information on product at right, circle 6931 see information request blank opposite last page.

SERVICE TEAM—This line-up is part of the reason why Metropolitan has been able to keep customer service up—costs down. H Model Mack-built Thermodyne® diesel-powered tractors like these handle bulk deliveries.

MACK for over 7 straight years NO.1 by far in sales of diesel trucks

Figure on Macks when trucks figure in profits

Stainless steel tankers of Metropolitan Fats & Oils, Inc., Jersey City, N. J., make on-schedule deliveries up and down the east coast from New England to the Carolinas . . . are known for their fast, dependable delivery of quality products.

Because highway transportation is the lifeline of Metropolitan's business, a close tab is kept on the economics of their truck operation. Says President Henry Oelkers, "Our Mack diesels are the most economical, reliable and generally satisfactory trucks we have ever owned. Each truck in our fleet averages over 2,000 miles a week . . . performs equally well in city traffic or on cross-country runs."

Mack makes sure you get the truck economy you need through the exclusive Mack practice of designing and building all its own major components. This results in what is called Balanced Design and assures that engines, gears, transmissions and other vital truck components will work together as an integrated unit for the greatest possible efficiency, performance and long life. Trucks that stand up under the most demanding operating conditions —not only when new, but after years of service—can mean the difference between a profitable operation and one drained by high costs per mile, unnecessary downtime and excessive maintenance.

Your local Mack branch or distributor will gladly give you full details on the truck best suited to your operation. Mack Trucks, Inc., Plainfield, New Jersey. Mack Trucks of Canada, Ltd., Toronto, Ontario.

7748

MACK
FIRST NAME FOR
TRUCKS

1400 Cans a Minute

. . . on long lasting, non-lubricated Nylite "D" conveyor chain.

New "Delrin" conveyor chain now called Nylite "D" offers:

- no lubrication
- longer life
- lower original and maintenance costs
- lower coefficient of friction
- less noise
- more sanitary advantages
- equally good for plastic containers, bottles and cans.
- numerous safety factors
- higher speed

These advantages were proven through rigid comparative tests with metal chains for the past three years.

Now in stock: 3" — 3¼" — 4" — 4½" — 6" — 7½" widths

Write today for new pamphlet

FENCO, INC. | 125 N. Racine Ave. Chicago 7, Illinois

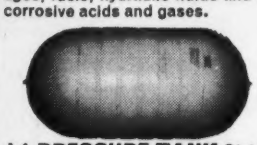
6932 on Reader Service Slip.

FLUID & GAS PRESSURE TANKS

STAINLESS & CARBON STEEL TANKS

(GOVERNMENT SURPLUS BARGAINS)

Steel tanks for the handling, storage and transportation of gases, beverages, fuels, hydraulic fluids and other liquids. Stainless steel tanks for corrosive acids and gases.

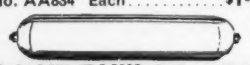


J-1 PRESSURE TANK Stainless steel, surplus aircraft oxygen tank. 48" long, 24" dia. Rated for 400 P.S.I. working pressure, 18,000 cu. in. vol., 77.9 gal. capacity. ¼" pipe thread fitting at each end. New condition. Shipping weight 247 lbs. F.O.B. Chicago.
No. AA832.....$99.50

G-1 TANK Stainless steel. Capacity 2100 cu. in. (9 gals.) 450 P.S.I. ¼" pipe thread port at each end. 24" long, 12" dia. Shipping weight 19 lbs. F.O.B. Chicago. (Two for $27.00.)
No. AA63 Each.....$14.95

NON-SHATTERABLE CO_2 CYLINDER This type of pressure bottle was used by the Armed Forces for inflating life rafts. 18¼" long, 3¾" dia. Has ¼" pipe thread opening at one end. Capacity 2.98 lbs. of CO_2—at 1800 P.S.I. Shipping weight 10 lbs. F.O.B. Chicago.
No. AA303.....$2.50

FREON TANK Capacity 22 oz. of Freon F22, 6 cc Methyl Alcohol. 18¼" long, 2" dia. ¾" pipe thread opening at one end. Equipped with brass valve. Shipping weight 3 lbs. F.O.B. Chicago. (Six for $8.00).
No. AA834 Each.....$1.50



D-2 AIR TANK Carbon steel. Capacity 500 cu. in. (approx. 2 gals.) 450 P.S.I. ¼" pipe thread port at each end. 24" long, 6" dia. Postpaid. (Two for $8.50).
No. AA391 Each.....$4.95

CORNELIUS HIGH PRESSURE (1500-2000 P.S.I.) AIR COMPRESSOR Three cylinder, 3-stage compressor, complete with 27 volt, D.C. 20 amp. motor, with fan. Rated 1500 P.S.I. continuous duty, 2000 P.S.I. intermittent. Pressure switch in base. As released by Air Force, in used, serviceable condition. Covered by our 30 day GUARANTEE. 11¼" long, 7" high, 9" wide. Shipping weight 12 lbs. F.O.B. Chicago. Limited quantity.
No. AA549.....$35.00

Write today for FREE CATALOG of other EQUIPMENT BARGAINS!

GROBAN SUPPLY COMPANY

1139 S. Wabash Ave., Dept. AA-11, Chicago 5, Ill., WEbster 9-3793

6933 on Reader Service Slip.

material handling

continued from page 110

powered for travel, grabbing, lift and dumping. Models range from high-speed, heavy duty down to type needed for occasional use operation.

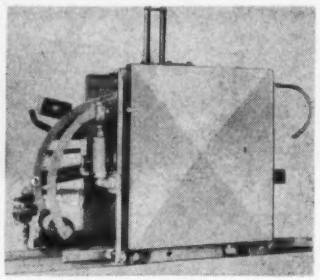
Supplier: Uhrden, Inc., Dennison, Ohio.

6934 on Reader Service Slip.

Automatically closes flaps and turns cartons over

Uses: Carton Turn-Over has appeal for manufacturers of glass containers, cans and other container types as answer to their problem of automatically closing and securing their containers in cartons that must be left unsealed for shipment to food processor customers.

Processors receiving such shipments of unsealed flapped



Comparatively small, compact unit can be installed on new or existing conveyor lines

cartons need the Carton Turn-Over to automatically right the cartons.

Features-Description: Completely automatic, and requiring no operator, unit closes flaps of cartons and turns cartons over as they pass along conveyor.

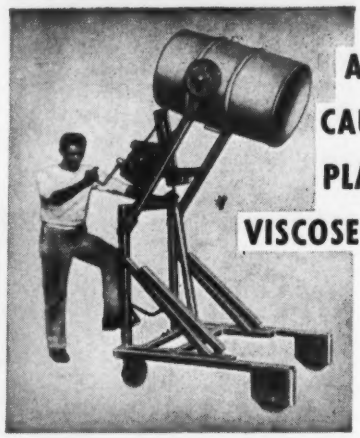
Machine handles any size carton from 8 by 8 by 3½ in. up to 24 by 18 by 16 in., and any carton weight from three lb to 60 lb, at speeds of up to 10 cartons per min. It operates electrically (110-v, one-phase, 60-cy), and on compressed air (40 psig).

Unit's low cost makes it practical for even fringe applications.

Supplier: Lathrop Paulson Co., 2459 W. 48th St., Chicago 32, Ill.

6935 on Reader Service Slip.

CONTROLLED POURING



OF

ACIDS
CAUSTICS
PLASTICS
VISCOSE MATERIALS

with the Model CP-1 Sterling Hydraulic Drum Lift. Be assured of self-locking and absolute control at any pouring angle.

Lifting capacity 750 lbs. Lifting height 72". For complete details and specification on the CP-1 model and other model Sterling Hydraulic Drum Lifts, write. Dept. FP-11

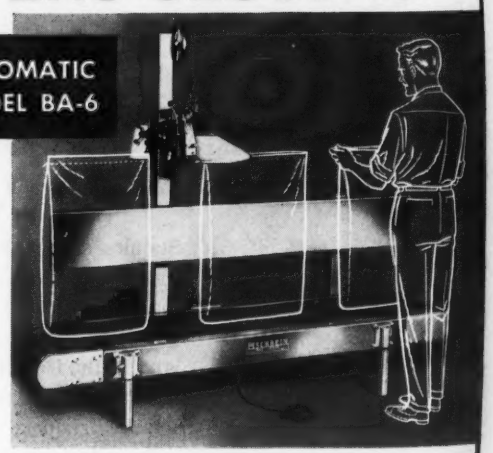
STERLING, FLEISCHMAN COMPANY

P. O. Box 94 Broomall, Pa.

6936 on Reader Service Slip.

FISCHBEIN LOW COST EFFICIENT BAG CLOSERS

AUTOMATIC MODEL BA-6



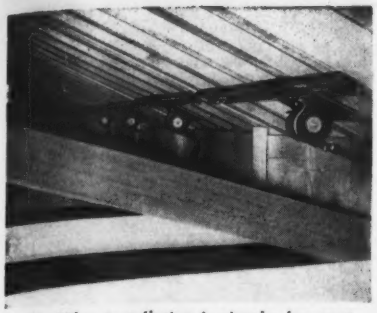
Bags start the sewing operation when they reach the head. After sewing, thread is cut automatically and conveyor belt continues to move bag. Instantaneous start/stop controls.

WRITE FOR COMPLETE CATALOG FILE OF BAG CLOSING EQUIPMENT

DAVE FISCHBEIN CO., Dept. 2A

2720 30th Ave. S., Minneapolis 6, Minn., U.S.A.

6937 on Reader Service Slip.



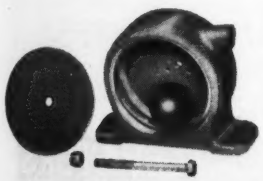
AiroViber installation is simple, low-cost.

Keep bulk materials MOVING!

Gain Quiet, Efficient Materials Movement and Low-Cost, Maintenance-Free Operation with AiroViber Vibrators!

Wherever you load, unload, move, package, process, grade or separate bulk materials, you can keep them MOVING with simple, ball type, pneumatically-operated AiroViber Vibrators!

- Start without fail.
- Trouble-free — only one moving part.
- Completely uneffected by surrounding conditions or temperatures.
- No lubrication needed.
- No periodic maintenance required.
- Speed is controlled by air valve.
- Amplitude can be altered.
- Where explosive conditions exist bronze balls may be used.



Steel ball (only moving part) rolls on hardened, ground track.

WRITE TODAY for full information!

VIBER COMPANY 726 S. Flower St. Burbank 56 California

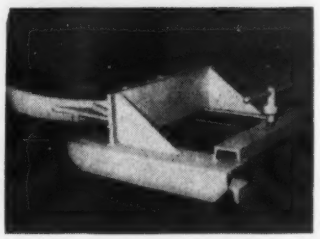
VIBER CO

Pioneers and leaders in the manufacture of

VIBRATORS

6938 on Reader Service Slip.

New developments in lift trucks

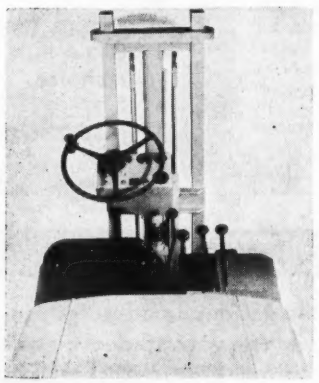


Safe, quick handling of all sizes of steel drums — one or two at a time — is provided by Kughler Vert-O-Matic Drum Arms. Mounted on the forks or apron of any make or model of lift truck, and almost any make of walkie and straddle truck, the mechanical drum-handling arms automatically pick up drums in the vertical position.

Attachment is especially suited to narrow-aisle stacking, as arms take up only a few in. more space than the drums.

Supplier: Little Giant Products, Inc., 1530-50 E. Adams St., Peoria, Ill.

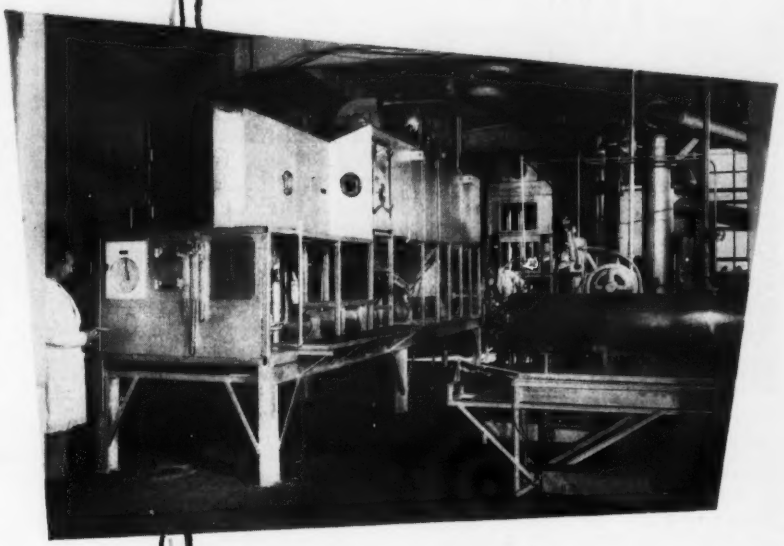
6939 on Reader Service Slip.



Narrower frames . . . by as much as seven in . . . decrease turning radius by nearly 34 in., and make revised line of gas-powered fork lift trucks much more applicable to "in-door-outdoor" operations.

Complete conversion to power steering permits elimination of steering column, pittman arm and drag link — making it easier to work on and re-

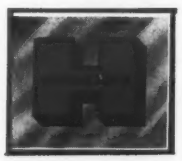
this Henszey Pilot Plant gives you a running start on your competition



Designed and built with *your* profits in mind, this newly-installed process pilot plant is ready and waiting to test and prove your processing ideas.

The scaled-down Henszey evaporating, drying and heating equipment has a capacity of up to 800 pounds per hour. It will handle dairy and food product experiments and test runs to *your* specifications.

These complete facilities, including the services of competent Henszey Engineers, are available dependent upon current test schedules. Write today for full particulars.

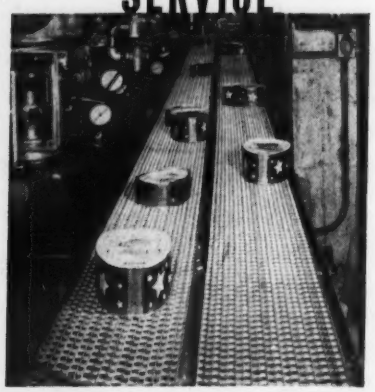


HENSZEY COMPANY
INCORPORATED
Dept. FP
WATERTOWN, WISCONSIN

ANOTHER HENSZEY PROCESSING *first*

6940 on Reader Service Slip.

LA PORTE
FLEXIBLE STEEL CONVEYOR BELTS
COST LESS TO INSTALL
STERILIZE
SERVICE



More and more food plants are installing La Porte Flexible Steel Conveyor Belts to offset rising production, maintenance and replacement costs. Their sturdy, durable steel construction prevents stretching, resists impacts, wear, heat and cold. The flexible, open-mesh design assures a positive drive on the La Porte Drive Sprocket, permits the free circulation of air and liquids around products in process, also saves time sterilizing with a steam gun or scalding water. La Porte Belts provide a perfectly flat surface for the safe handling of glass, tin or paper containers empty or filled, including shipping cartons. Besides, these long-wearing belts require little maintenance.

If you freeze, can, dehydrate, pickle, package, store or ship food, it will pay you to use La Porte belts. Available in ½" x 1", or 1" x 1" in any length and practically any width. Ask your mill supplier or mail coupon for illustrated literature and prices.

MAIL COUPON TODAY

LA PORTE MAT & MFG. CO.
Box 124 Dept. A
La Porte, Indiana

Please send free literature on your Conveyor Belt.

NAME_____

ADDRESS_____

CITY_____ STATE_____

6941 on Reader Service Slip.

place the clutch, and increasing the underclearance.

For added underclearance, linkage has been inverted and tucked up under the truck, where it is better protected.

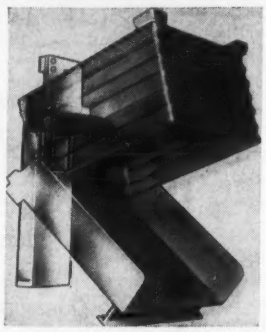
Other improvements include completely new exhaust system to reduce back pressure and give much quieter operation, and a fully instrumented and conveniently placed instrument panel. Lift speeds have been increased to 55 fpm.

Supplier: Pneumatic-tired fork trucks of 3000-, 4000- and 5000-lb capacity (Y-3024, Y-4024 and Y-5024) are manufactured by Truck-Man Lift Trucks, 557 Liberty St., Jackson, Mich.

6942 on Reader Service Slip.

Lift-truck device dumps all drop-bottom boxes

Simple, inexpensive hydraulic attachment dumps all makes of drop-bottom boxes regardless of contents. Lift-truck operator does entire job — raises boxes to desired height and dumps them.



Dumper (at left) comes in 4000-, 6000-, 8000- and 10,000 lb capacity units

Attachment consists of all-welded body with hardened guide bars and full-floating cylinders. Simple bracket welded to top edge of drop-bottom box engages bracket on dumper. Truck's forks remain unchanged.

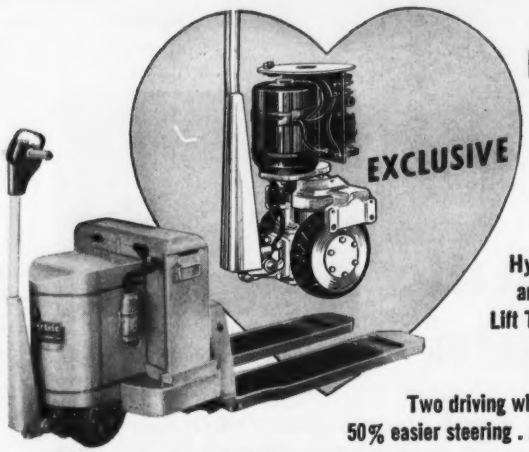
Dumper fits any make and model lift truck.

Supplier: Little Giant Products, Inc., 1530-50 N. Adams St., Peoria, Ill.

6943 on Reader Service Slip.

HEART OF THE HydroLectric

. . . THE DYNA-DUAL POWER UNIT



Compare the Hydrolectric features with any other "Driver Lead" Lift Truck. The Hydrolectric quality of construction merits your inquiry.
Two driving wheels instead of one . . . 50% easier steering . . . ease of maintenance.

NOTE: The Dyna-Dual Power Unit is interchangeable on all models.

A TRUCK FOR EVERY PURPOSE AND MATERIAL

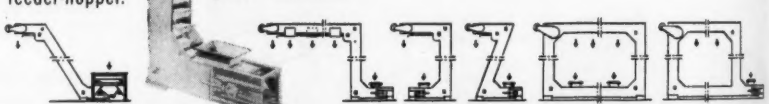
LIFT TRUCKS, INC.
CINCINNATI 14, OHIO

6944 on Reader Service Slip.

MEYER *Simplex* CONVEYING ELEVATORS

At Right, standard model with production hopper. Below, with Vibra-Flex feeder-hopper.

. . . are famous for their Dependability, Efficiency and Versatility. They safely and gently carry even the most delicate of products to any desired combination of horizontal, vertical or inclined distances, and are available in a size, capacity and configuration of your choice.



Write for BULLETIN 910

MEYER *Continuous Bucket, Roller Chain* ELEVATORS

Sensibly designed and sturdily built to gently and efficiently handle your product on a continuous day-in year-out basis, many Meyer Bucket Elevators are in daily operation after more than two decades of low maintenance service. Available in any required size and capacity.

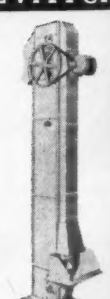
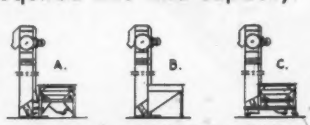


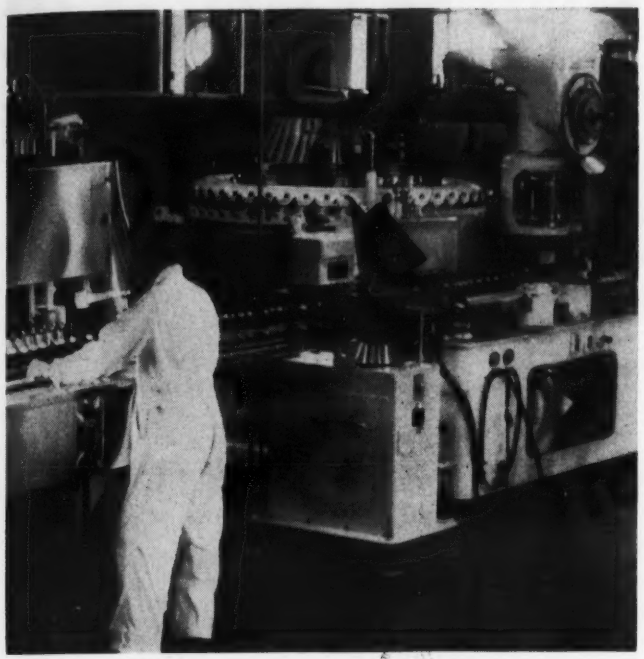
Photo at right shows Elevator with small hopper. Also available with Vibra-Flex feeder-hopper (A); with holding bins in any size or capacity (B), or as a portable unit (C).



Write for BULLETIN 912

MEYER MACHINE COMPANY
3528 FREDERICKSBURG R
P. O. BOX 5096
SAN ANTONIO 1, TEXAS

6945 on Reader Service Slip.



Bottle inspector (arrow) scans empties after they leave washer at left, on their way to filler at right

At Coca-Cola Bottling Co. of Los Angeles . . .

Advanced inspection units spot tiny particles at top speed

Optically scan insides of empties for objects as small as 1/100 sq in., at speeds to 400 bottles per min

Problem: Coca-Cola Bottling Co. of Los Angeles has long been interested in more accurate inspection of bottles, so were keenly interested in a prototype automatic bottle inspector which they installed 22 months ago.

Solution: Machine optically scans interior of a bottle, including entire bottom area and a cone-shaped volume extending upwards through the opening.

Objects which come into this scanned area are sensed by a reflectance mechanism, and bottle is rejected. Both metallic and non-metallic objects in bottle are detected by the Mark IV inspector, manufactured by Geo. J. Meyer Manufacturing Co., P.O. Box 452, Milwaukee 1, Wis.

Since the system is a contrast detector, even translucent and transparent objects such as cellophane and glass chips are detected.

System also rejects bottles having cracked or badly chipped bottoms. Applied color labels do not affect operation.

No spacing between bottles

I. J. GRASS NOODLE CO.
DOUBLES PACKAGE PRODUCTION
with HAYSSEN COMPAK

The I. J. Grass Noodle Company, Chicago, Illinois, uses the above Hayssen Compak to automatically package their famous chicken and vegetable soup concentrates at continuous production speeds of 124 packages per minute. The 2¼" x 4" bag is a part of the complete dry soup package. This production rate is twice that of their former semi-automatic method and is accomplished with half the labor force. Another example of how you save with Compak.

Plant Superintendent William Fieroh has this to say about Compak:

- **HI SPEED** – Our Compak, on a regular two shift day produces 7,440 packages of concentrate at the rate of 124 packages per minute.
- **DEPENDABILITY** – The Hayssen Compak handles all films regardless of film variations in thickness or coating. Compak continues to produce high quality packages without nuisance adjustments or shutdown time throughout our two shifts.
- **ECONOMY** – A plus or minus 2 gram permissible variation is maintained with the Compak volumetric feed. This means minimum product waste, assures uniform product and continued customer satisfaction.

Let Hayssen help you with your automatic packaging problems. Write or call your nearest Hayssen office today!

first in Automatic Packaging Since 1910

HAYSSEN

MANUFACTURING COMPANY • DEPT. FP-114 • SHEBOYGAN, WISCONSIN

Offices in principal cities. Check your phone directory.

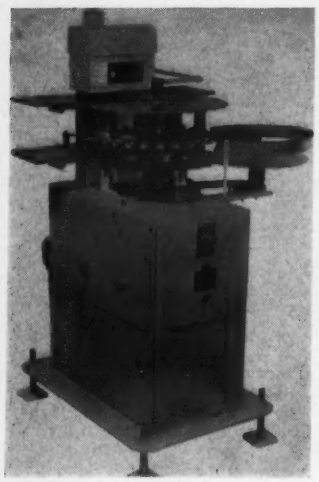
Atlanta • Boston • Chicago • Columbus • Dallas • Denver • Detroit • Evansville, Ind. • Jackson, Miss. • Kansas City Minneapolis • New York • Philadelphia • St. Louis • San Francisco • Montreal • Toronto • Vancouver

6946 on Reader Service Slip.

is required. A 20-in. starwheel overhangs the conveyor, so that no line break is necessary for installation. A variable-speed motor allows bottle inspector to be synchronized with filler.

Rejected bottles are shunted onto an accumulator disc for manual inspection and disposal.

Results: The prototype, completely debugged for commercial use, still is in operation, along with new detectors



Unit is built to straddle existing conveyor, requiring no line change

on each of the other two lines at Coca-Cola Bottling Co. of Los Angeles.

System gives over 99 per cent accuracy in detecting the types of foreign matter most frequently resulting in complaints.

Objects as small as 1/100 of a sq in. — much smaller than can be detected consistently by eye at production line speeds — are detected in actual plant operation.

Mark IV inspector operates at speeds to 400 bottles per min, and far surpasses the accuracy normally obtained by visual inspection.

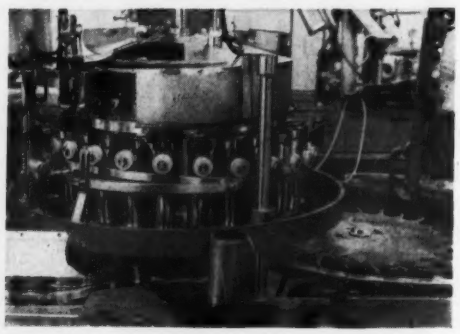
Beer bottles also can be inspected at these rates. The designers also are working on an inspector for milk bottles, which, because of their conformation, present a different problem.

6947 on Reader Service Slip.

Votator® PISTON FILLER'S

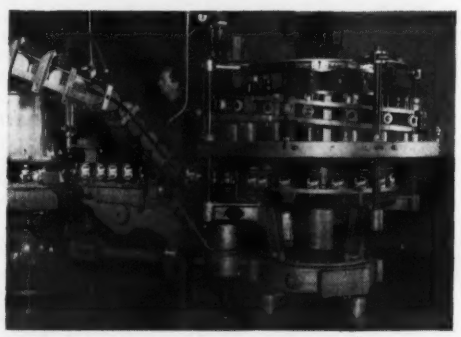
NEW MAGNETIC VALVE

The Magnetic Monitor* Valve Control† on VOTATOR piston fillers consists of a combination of indestructible permanent magnets and the pneumatic lift for positioning the valves. This assembly, with only two moving sections, provides:



Courtesy Gerber Products Co.

New, higher standards of packaging economy are being realized by processors of a wide variety of products. VOTATOR Piston Fillers give close-tolerance filling of liquids and viscous materials at remarkable speeds. No-container, no-fill controls safeguard against interruption of operation and waste. And, new Magnetic Monitor valve control prevents costly damage and downtime.



Courtesy Castrol Oils, Inc.

Another VOTATOR Piston Filler *first* bringing you still more advantages and savings. Write today for Bulletins PED-259 and PED-260.

a. Positive no-container, no-fill operation.

b. The elimination of every possibility of a valve jam due to over-sized particles in the product or the malfunction of any associated equipment.

c. A completely smooth valve action to eliminate all splashing of product.

VOTATOR PISTON AND GRAVITY FILLERS ARE AVAILABLE FOR ALL PRACTICAL SPEEDS AND CONTAINER SIZES

GIRDLER PROCESS EQUIPMENT DIVISION

CHEMETRON CORPORATION

Louisville 1, Kentucky

CHEMETRON

Sales Offices: Louisville • New York • Chicago • Houston • Los Angeles • San Francisco

*Trademark †Patent pending

VOTATOR CONTINUOUS PROCESSING EQUIPMENT FOR CHEMICAL & FOOD INDUSTRIES • VOTATOR PISTON & GRAVITY FILLERS • VOTATOR PLANTS FOR FATTY OILS INDUSTRY • THERMEX DIELECTRIC HEATING EQUIPMENT

6948 on Reader Service Slip.

Foil-board can with easy-open tear-tab top

. . . may have potent potential as frozen concentrate package

Two radically new features — a quick-opening aluminum top and a low-cost foil-and-paperboard rigid laminated body — are incorporated in experimental Safe Pack container developed by Aluminum Company of America and United Shoe Machinery Corp.

If evaluation of results of a recently completed market test in Providence, R.I. — involving Minute Maid frozen orange

Simple pull on tab welded to aluminum can-end instantly removes entire top — leaving a smooth, safe opening

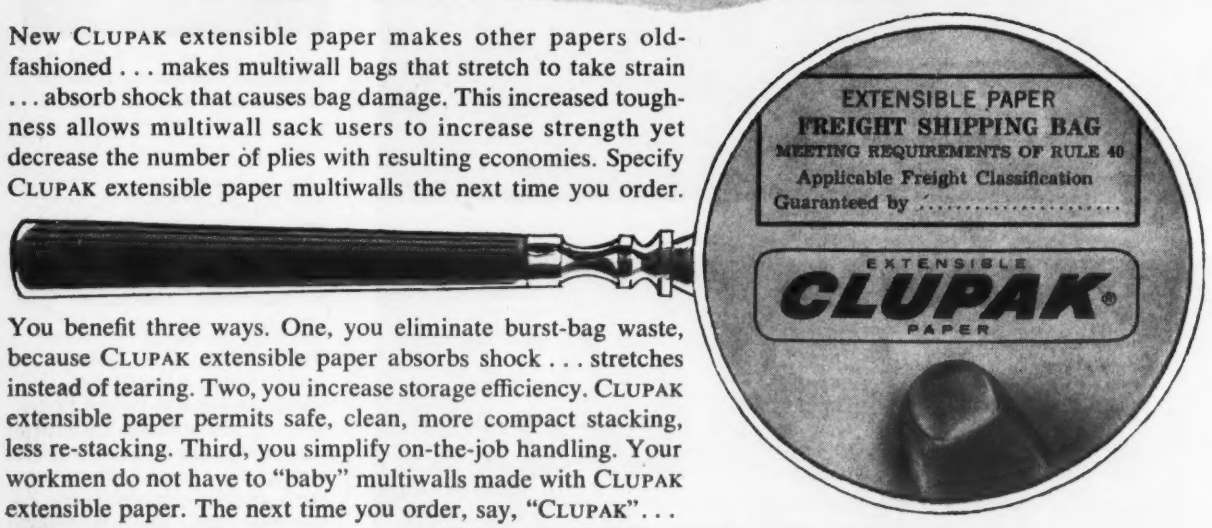
juice concentrate — verifies the expected high consumer acceptance, the unique can ends will be adapted as quickly as possible by the developers to full-scale production on high-speed equipment.

Quick-open top features a welded-on aluminum tab which provides a looped finger opening. By merely lifting the loop and pulling, the tab tears out a thin, scored aluminum strip around circumference of the top, and the top comes free with the strip.

The remarkable opening feature could boost sales of beverages in cans, and could

ELEMENTARY...IT'S A EXTENSIBLE CLUPAK® PAPER* MULTIWALL BAG ...THAT'S WHY IT DIDN'T BREAK!

New CLUPAK extensible paper makes other papers old-fashioned . . . makes multiwall bags that stretch to take strain . . . absorb shock that causes bag damage. This increased toughness allows multiwall sack users to increase strength yet decrease the number of plies with resulting economies. Specify CLUPAK extensible paper multiwalls the next time you order.



You benefit three ways. One, you eliminate burst-bag waste, because CLUPAK extensible paper absorbs shock . . . stretches instead of tearing. Two, you increase storage efficiency. CLUPAK extensible paper permits safe, clean, more compact stacking, less re-stacking. Third, you simplify on-the-job handling. Your workmen do not have to "baby" multiwalls made with CLUPAK extensible paper. The next time you order, say, "CLUPAK"... before you say paper.

*Clupak, Inc.'s trademark for extensible paper manufactured under its authority and satisfying its specifications. Clupak, Inc., 530 5th Ave., N. Y. 36, N. Y.

6949 on Reader Service Slip.

open up the vending machine market for many packers heretofore deterred because of limitations in can-opening methods available.

Composite can development itself consists of a foil-board lamination for the body, with an overlap seam — and aluminum ends.

The body lamination can be suited to the product being packed. For example, it can consist of a lamination of paperboard, sandwiched between two layers of foil, or, of one layer of foil with paperboard.

Since the lamination is supplied in coil form, the sides can be colorfully rotogravure preprinted before the can is formed.

Supplier: Can body and ends (including tear-tab top) experimentally developed by Aluminum Company of America, 1501 Alcoa Bldg., Pittsburgh 19, Pa.

6950 on Reader Service Slip.

Supplier: Can-making equipment experimentally developed by United Shoe Machinery Corp., 140 Federal St., Boston, Mass.

6951 on Reader Service Slip.

'Breakthrough' in corrugated cartons

Unique double hinge formed by new crease-fold method overcomes folding fracture weakness of conventionally scored cartons

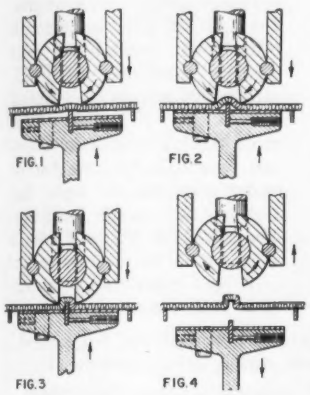
New "Hinge-Fold" technique for the first time provides a practical means of creasing and folding corrugated in accordance with the nature of the material.

Result is a stronger hinge than formed by traditional method, plus an accuracy of folding which should set new standards of uniformity.

Ordinary scoring with a knife-edge scoring wheel or rule tends to cut fibers, and thus weaken the board. Moreover, when board scored in this manner is folded, fibers on outside of the "hinge" thus

formed are stretched thin, while those on inside are compressed — further weakening the fold area.

New method embosses in the flat board a square-edged



Combination of male and female rules of rotary "pinch bar" creaser results in forming of a double-hinged corner

"ridge" (see patent diagrams) which is both wider and deeper than the thickness of the stock.

This type of score results in a double hinge which distributes the folding stress over a much greater area, reduces stretching of outer fibers to a minimum and eliminates fiber fracture.

Extensive testing by Container Laboratories, Inc., New York, N.Y., revealed that "Hinge-Fold" scoring had less of a weakening effect than had conventional scoring upon otherwise identical samples of corrugated fiberboard. This was consistently evident in tensile and slip-tear tests.

Cartons formed with "Hinge-Fold" scoring had better top-to-bottom compressive resistance than boxes with conventional scoring, and withstood longer the abuse of buffeting in a standard seven-ft revolving hexagonal drum.

Supplier: "Hinge-Fold" scoring method for corrugated board, now in use by three major carton manufacturers, is patented development of The International Paper Box Machine Co., Nashua, N.H.

6952 on Reader Service Slip.

LINK-BELT S-815 flat-top chain with

Dovetail Design

assures smooth pickup, smooth ride for containers

Here's a simple, durable, moderately priced flat-top chain specially designed to treat containers gently.

One-piece steel links dovetail to form a level, continuous carrying surface. This design, together with beveled edges, assures smooth pickups and transfers . . . reduces danger of tipping stalled or slow-moving containers.

Dovetail design also assures long life for Link-Belt S-815 flat-top chain. Pulling load is absorbed by entire link during chain-sprocket contact. Results: wide load distribution, low unit bearing pressure on sprocket teeth, no load on pin during articulation.

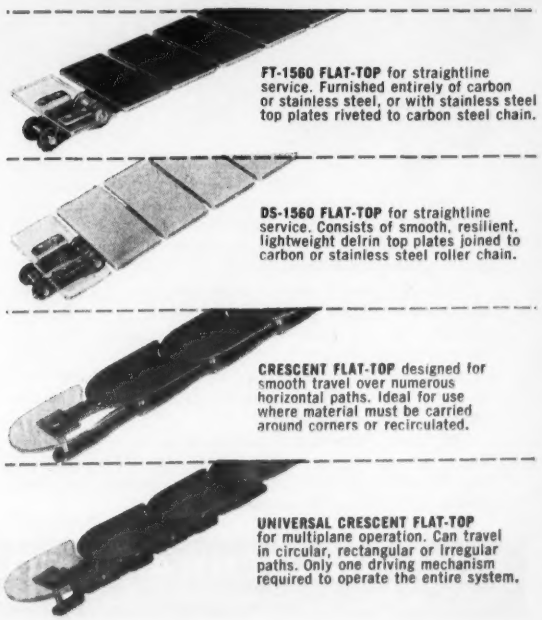
For complete details on S-815 and all other Link-Belt flat-top chains, contact your nearest Link-Belt office or authorized stock-carrying distributor. See CHAINS in the yellow pages. Or write for Catalog 1050.

LINK-BELT

CHAINS & SPROCKETS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Warehouses, District Sales Offices and Stock Carrying Distributors in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney); Brazil, Sao Paulo; Canada, Scarboro (Toronto 13); South Africa, Springs. Representatives Throughout the World. 15,416

OTHER LINK-BELT FLAT-TOP CHAINS



FT-1560 FLAT-TOP for straightline service. Furnished entirely of carbon or stainless steel, or with stainless steel top plates riveted to carbon steel chain.

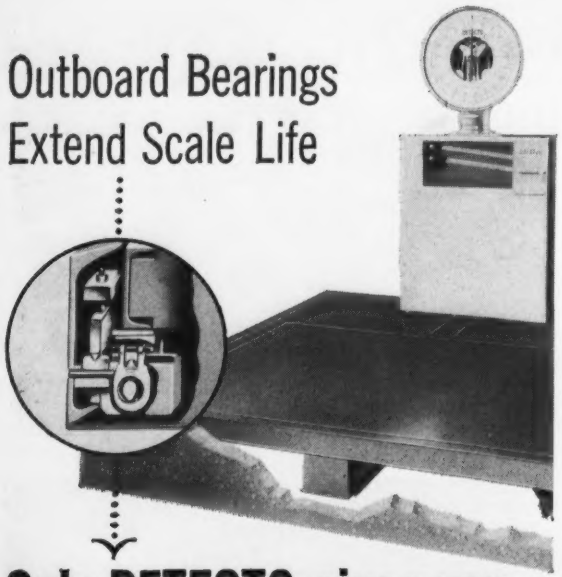
DS-1560 FLAT-TOP for straightline service. Consists of smooth, resilient, lightweight delrin top plates joined to carbon or stainless steel roller chain.

CRESCENT FLAT-TOP designed for smooth travel over numerous horizontal paths. Ideal for use where material must be carried around corners or recirculated.

UNIVERSAL CRESCENT FLAT-TOP for multiplane operation. Can travel in circular, rectangular or irregular paths. Only one driving mechanism required to operate the entire system.

6953 on Reader Service Slip.

Outboard Bearings Extend Scale Life



Only DETECTO gives you OUTBOARD BEARINGS!

Write for information on full line of industrial weighing equipment from 1/100 oz. to 100 ton;
Detecto Scales, Inc., Dept. K-3, 540 Park Ave., Brooklyn 5, N.Y.

6954 on Reader Service Slip.

The new Langsenkamp "101" Can Opener is completely automatic . . . does the work of four men. Depending on the product's consistency, it can open, drain and rinse up to 20 No. 10's a minute. Positively eliminates the chance of can slivers getting into your product.

Ideal for canners, frozen food processors, bakers, or any users of liquid or semi-paste product . . . for any product that will drain through a 4" opening. Provides cleaner, more efficient handling—no loss due to spilling or splashing of product. Equipped with stainless steel underpan 60" x 20" x 15" wide, ¾ hp motor, 806 lbs. net weight, pump optional.

The "101" Automatic Can Opener is one of a complete line of Langsenkamp machines for food processors which also includes manually-operated can openers and automatic can crushers. Write for full details.

F. H. LANGSENKAMP CO.
227 E. SOUTH ST. • INDIANAPOLIS 4, INDIANA

6955 on Reader Service Slip.

packaging

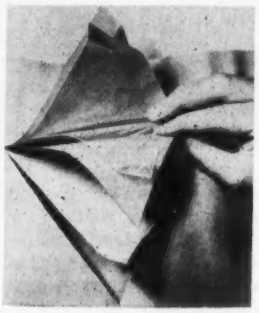
Unique poly-and-paper 'sandwich' multiwall bags offer . . .

Moisture-resistance, strength, flexibility at economy prices

Uses: Originally developed for Morton Salt Company as containers for salt shipments, commercially tested new line of Poly-Ply Multiwalls is expected to find extensive application in packaging of sugar and other moisture-sensitive foods and non-foods that are unaffected by contact with paper.

Features-Description: Special multiwall structure includes a separate intermediate ply (not a liner) of lightweight sheet polyethylene — spot-pasted at top and bottom to adjacent layers of heavy-duty kraft paper.

As result, the polyethylene film is not next to the product. It is protected from abrasion and other mechanical injuries from the bag contents as well as from the outside.



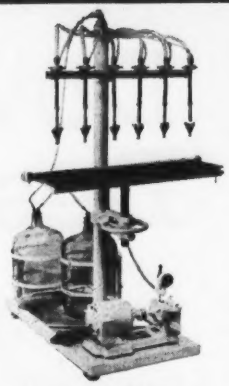
Cutaway of bag wall shows how free ply of sheet poly is shielded by heavy-duty kraft inside and out

Polyethylene as a moisture barrier offers the advantage of great flexibility, even at extremely low temperatures. Use of sheet polyethylene for this purpose instead of light poly-coated kraft gives superior moisture resistance.

Supplier: Chase Bag Co., 153-157 E. 44th St., New York 17, N.Y.

6956 on Reader Service Slip.

BOTTLE FILLING PROBLEMS?



Model BV-1 Vacuum Filler with 6 stainless steel spouts, crated f.o.b. Los Angeles—$655.00

Solve your bottle filling problems with the OGDEN BOTTLE FILLER!
This dependable, accurate, and rapid filling machine is the most versatile bottle filler on the market today for small production and semi-automatic operations. The OGDEN filler will handle practically any type and size of container — glass, plastic, or metal — from 4 ounces to 1 gallon, and most liquids including foaming products. Fill rate for 6-spout machine on light liquids — 600 quarts per hour. The OGDEN Bottle Filler is also noted for its low initial cost and inexpensive operation and maintenance.

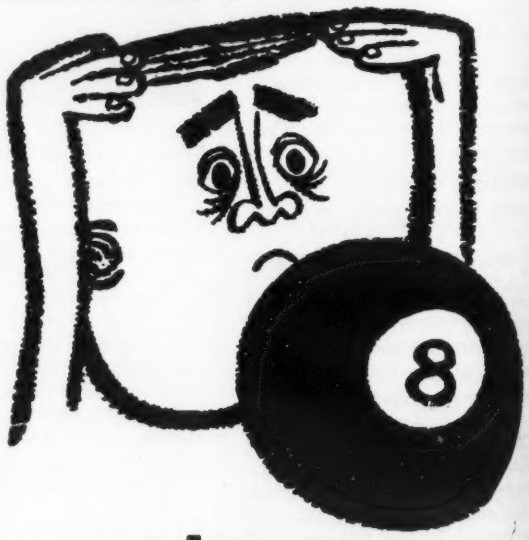
For more than 27 years, OGDEN Bottling Equipment has been used for efficient production packaging of . . .

• Juices • Sauces • Non-carbonated beverages
• Syrups • Oils • Many other liquid products

WRITE TODAY — for general catalog and low prices!

OGDEN *filter Co., Inc.*
4214 SANTA MONICA BLVD., LOS ANGELES 29, CALIF.
"Manufacturers of fine filtration equipment since 1929"

6957 on Reader Service Slip.



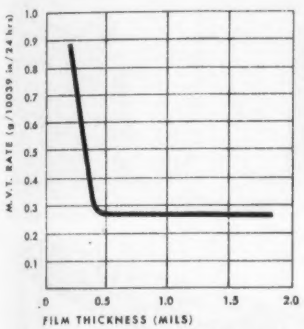
need more information . . .

Note there is a key number at the end of editorial articles or advertisements. To request more information circle the proper number on the convenient form opposite the last page. Send the form to us . . . we do the rest. Information comes direct to you. No obligation, of course.

Explains new protective coating for packaging

Technical information on recently introduced Resyn 3600 — an aqueous dispersion of vinylidene chloride copolymer — is supplied by newly published Bulletin 340.

Because of its outstanding combination of barrier and application properties, the new National Starch product is expected to find wide usage as a protective coating for packaging materials.



If film is applied to unbleached kraft in thickness as minute as ½ mil, water-vapor transmission rate is reduced effectively

The literature describes the physical and chemical properties of Resyn 3600 — both in latex and film forms.

It also specifies status of government approvals for food packaging applications.

6958 on Reader Service Slip.

New inks brilliantly withstand cooking process

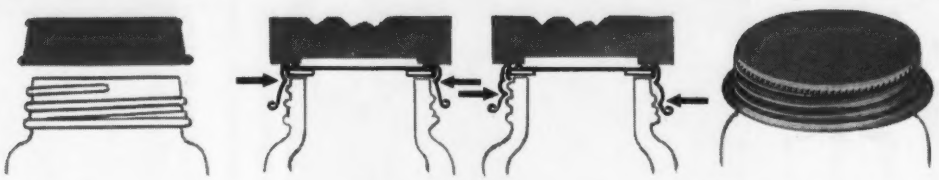
Colored inks that can easily be applied to cans for identification and segregation, and that can withstand the cooking operation, are phenol-free, non-bleeding and have excellent brilliance (in any of six colors) for quick identification.

The inks remain open in the printing mechanism for extended periods of time, yet dry hard and fast on the tin.

Supplier: The California Ink Co., Inc., 545 Sansome St., San Francisco 11, Calif.

6959 on Reader Service Slip.

EACH CAP...



The unthreaded aluminum closure is placed on the jar and seated on sealing surface with a controlled uniform pressure.

Rollers revolve and form the closure by shaping the skirt against the glass threads. Since the protective liner is not turned against the glass lip during sealing, there is no cutting or scoring of the liner and no danger of air leakage.

A CUSTOM FIT!

WITH ALCOA'S NEW ALUMINUM SCREW-ON CAP

Alcoa's Roll-On process means that every aluminum cap is tailor-made to fit each jar, regardless of maximum and minimum tolerance. And because of this individual fitting, the contents of every baby food jar are getting the best protection available today. The Roll-On process also insures maximum production efficiency with minimum downtime.

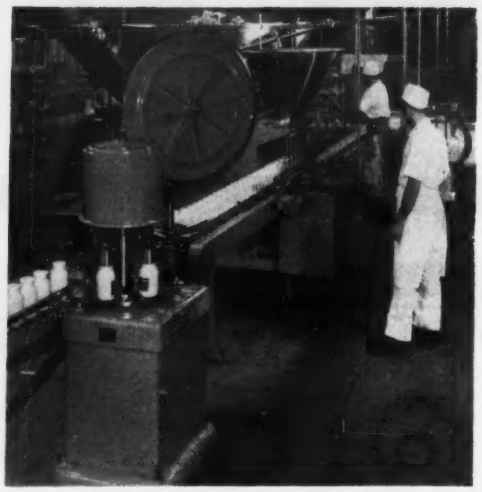
Acid-resistant, corrosion-resistant aluminum caps are friendly to food. Straight meats cannot affect the aluminum cap liner. And Alcoa® Aluminum caps stay bright and clean . . . never tarnish. So where protection counts . . . you can count on Alcoa Aluminum caps. Nine out of ten mothers prefer them. We invite your inquiry. Write Aluminum Company of America, Box 2048-L, Pittsburgh 19, Pa.

ALCOA ALUMINUM

Better Packaging

6960 on Reader Service Slip.

IT PAYS TO CAP'EM with CAPEM



Model C-4F CAPEM in action on the new mayonnaise and salad dressing line at Pfeiffer Food Products, Buffalo, N. Y.

This CAPEM machine is applying 70mm caps to 7200 jars an hour. A new Consolidated feature is a special chuck-arresting device which prevents the chuck from descending if no caps are available.

CAPEM Screw Capper speeds range from 2,000 to 20,000 containers an hour for any standard cap or cover and many special types. They combine low initial cost, with low operating and maintenance cost.

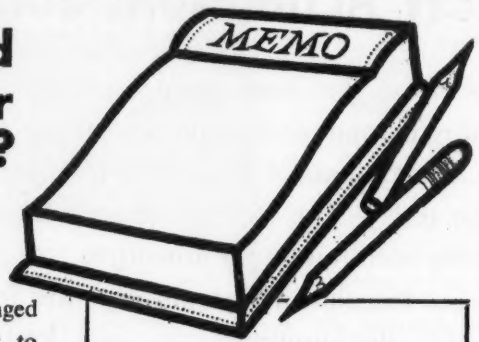
CAPEM delivers a perfect *leakproof* seal whether you're processing bottles, cans or jugs of any shape or size. Our customers agree—and you will too—*it pays* to cap 'em with CAPEM!

Write Sales Manager, Consolidated Packaging Machinery Corp.,
(a subsidiary of International Paper Company)
1400 West Avenue, Buffalo 13, New York

—CAPEM→ THE MODERN SCREW CAPPER

6961 on Reader Service Slip.

Changed Your Address?



BE SURE TO LET US KNOW!

If you have recently changed your address you'll want to make sure that your copy of Food Processing continues to reach you . . . just use this convenient form.

Please answer all the questions as completely as possible.

Mail request to
Reader Service Dept.
Food Processing
111 East Delaware Place
Chicago 11, Illinois

Former Company Affiliation .....

Former Address .....

Your Name ..... Present Title .....

Present Company .....

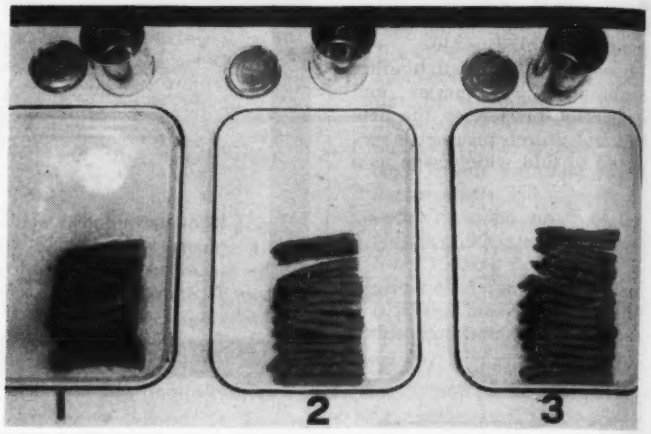
Main Product .....

Rating of Company .....

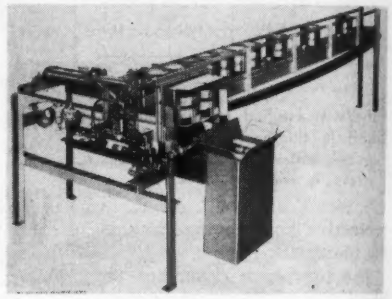
Street Address .....

City ..... Zone No. ..... State .....

Fragile canned asparagus tips provide realistic test of non-shock caser's gentleness. Contents of Can Nos. 2 and 3 — automatically loaded by an FMC Non-Shock Caser — are as perfect and intact as the spears from Can No. 1 at left, which was carefully hand-cased



Model 10 Caser can be built to accommodate any standard can size



For single-tier, end-open loading . . .

Brings 'non-shock' benefits to medium-speed casing

The same unique "non-shock" characteristics until now offered only on higher-speed FMC end-open and top-open casers now are available in a new unit for end-loading single-tier patterns of cans at medium or relatively low rates of production.

"Non-shock" casing eliminates free-rolling impact of cans—thus prevents dented can bodies, split seams, torn labels and scratched lithography, as well as possible damage to can contents.

Cans travel in an upright position—limiting all can contact to the containers' beads.

Designated FMC Model 10 Non-Shock End-Open Caser by Food Machinery and Chemical Corp., Canning Machinery Div., P.O. Box 1120, San Jose, Calif., or 103 E. Maple St., Hoopeston, Ill., the completely automatic unit will fill ten cases of No. 10 or No. 12 cans per min, and seven to nine cases per min when handling 46-oz, 307 x 710 and 307 x 700 size cans.

As cans are conveyed into machine's loading cham-

continued on page 124

Plants, Companies, Personalities

Army Quartermaster

Research Facility, designed specifically for use in connection with the Army's irradiated food program, will be built at the QM Research and Engineering Center, Natick, Mass. The facility — which will adapt for its use some of the equipment originally developed for the discontinued Stockton radiation plant, and will cost an additional $1.8 million — will be geared directly to the needs of the recently annuonced, revised, six-yr, $5 million Army program to accelerate research on specific irradiated foods for military use. It is expected to be operational late in 1962.

Charles P. McCormick

board chairman of McCormick & Co., Inc., Baltimore, has been presented with the 1960 Henry Laurence Gantt Medal of the American Management Assn. "for distinguished achievement in management as a service to the community."

Fabro, Inc.

Atlanta, Ga., one of the nation's largest processors of premium quality canned dog and cat food, has elected as president Col. Harry J. Robertson, USA (ret'd.). Col. Robertson, who founded Fabro as an outgrowth of his observations as an Army veterinary officer, succeeds A. A. Alterman, who resigned to become president of International Meat Processors, Inc.

Beatrice Foods Company

has promoted William R. Terrill and Delbert Thornley to the positions of managers, respectively, of the company's Idaho Creameries Division plant at Boise and Pocatello, Idaho.

For more information on product at right, circle 6962 see information request blank opposite last page.

NEW From the oldest name in weighing... COUNTER SCALES with space-age styling!

Slimmer! Trimmer! Styled to save space—match your facilities. AND unfailing accuracy to match your increased need for precise weight measurement.

Pounds lighter, smartly streamlined, these new models provide an accessibility that makes readings easier—a matter of a few seconds. Combining F-M accuracy with smart, compact design, these scales are truly the most modern in the industry!

FOR EVERY COUNTER SCALE USE—

These versatile utility scales come in 14″ x 18″ and 11″ x 14″ platform sizes. They have various capacities, (as high as 350 lbs.), and provide for weighing within accuracies of 1/100 lb.

For further information, see your nearby Fairbanks-Morse expert. Or write to: Fairbanks, Morse & Co.; Scale Division; Fair Lawn, New Jersey. Ask to see these F-M models today.

Fairbanks, Morse
SCALE DIVISION
A MAJOR INDUSTRIAL COMPONENT OF **FAIRBANKS WHITNEY CORPORATION**

The New F-M Union Scale

New F-M Suspended Platform Counter Scale With Double Beam

Union Scales
Suspended Platform Counter Scales With Single Beam
Suspended Platform Counter Scales With Double Beam (with or without scoop)
Suspended Platform Package Scales With Full Capacity Beam (tall pillar)
Suspended Platform Package Scales With Full Capacity Beam (short pillar)

ber, individual rows of a predetermined loading pattern are formed.

With each row, a switch is automatically activated, causing the pusher plate to advance the cans the distance of the diameter of the cans being handled — thereby allowing the next row to form.

When sufficient rows have been formed to permit assembling the full loading pattern in the chamber, a secondary relay switch is activated — allowing the pusher plate to transfer the entire pattern into the shipping case.

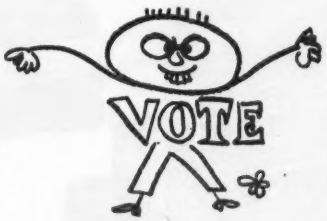
Actual case loading cannot begin until the loading chamber has its full complement of cans (thus preventing partially loaded cases), and until an empty shipping case has been manually positioned over the loading funnel.

When both conditions are met, machine's pusher plate is automatically activated for the final long stroke that transfers the full tier of containers into shipping case.

While cans are being transferred, case is supported in its position over the loading tube by a lowering arm, controlled by a limit switch.

Model 10's approximate over-all dimensions are: length, 12½ ft; width, 5¾ ft; height, 4 ft; can feed height, 3 ft. With exception of the conveyor belt, the caser is air-operated throughout.

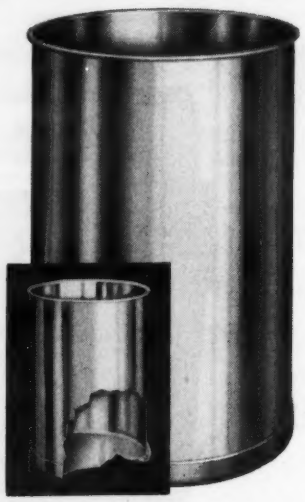
6964 on Reader Service Slip.



See this month's "FP Hall of Fame Cartoon" on page 127, and then vote for large reproduction of your favorite on the Reader Service Slip.

whether you need 1 or a carload

CALL ON INLAND FOR HIGH QUALITY STAINLESS STEEL DRUMS



If you process or store pharmaceuticals, meat products, high purity chemicals or any other products where absolute control of sanitation is necessary, Inland Stainless Steel Process Drums will make your job easier. Their durable, all-welded, stainless steel construction insures long life, and their special sanitary bottoms with smooth, rounded interiors permit complete emptying and easy cleaning and sterilizing.

Manufactured in 30 or 55 gallon capacity sizes, from many types of stainless steel, Inland Process Drums are also available with covers, or with I-bar or swedged rolling hoops. Call on Inland for your stainless steel shipping drums and pails too!

free "The Use and Care of Stainless Steel Drums"
Here is a useful, new booklet. It gives valuable information on how to use and get maximum life from stainless drums and fully describes the Inland line. Send in this coupon for your free copy.
☐ *Please send free copy of "The Use and Care of Stainless Steel Drums".*
☐ *Please have your representative contact me.*

Name _____ Title _____
Company _____
Address _____
City _____ Zone _____ State _____

INLAND STEEL CONTAINER COMPANY
Division of Inland Steel Company · 6532 South Menard Avenue, Chicago 38, Illinois · Plants: Chicago, Jersey City, New Orleans, Cleveland and Greenville, Ohio.
Full line of steel and stainless steel shipping and processing containers, including galvanized and heavy duty ICC drums.

6963 on Reader Service Slip.

Fill SALAD DRESSING?
colton-hope fillers and accessories give you special high-speed machines at the price of standards.

ARTHUR COLTON COMPANY
3476 E. Lafayette, Detroit 7, Michigan

60-12

6965 on Reader Service Slip.

Send for Catalog 51-55

Productimeters register accurate count of every unit processed . . . eliminate profit-eating losses . . . insure economical plant operation and maximum use of man hours.

DURANT MANUFACTURING CO.
1951 N. Buffum Street, Milwaukee 1, Wisconsin
51 Thurbers Ave., Providence 5, R. I.
Representatives in Principal Cities

DURANT
COUNTING INSTRUMENTS

6966 on Reader Service Slip.

technical literature Classified Listing

- **Equipment**
- **Ingredients**
- **Supplies**

Starred* items below have been more extensively reviewed elsewhere in the magazine. Key numbers in the last line will help to locate these reviews, which are numbered in sequence. Items followed by (†) indicate literature offered by advertisers — see Advertisers Index, page 131.

Processing Equipment, Accessories

Ups speed, power in lines of propeller mixes*, (two bulletins, each 4 pp: portable mixers, No. B-520; fixed mounting mixers, No. B-521) Mixing Equipment Co., Inc.
6864 on Reader Service Slip.

Presents large line of bakery mixers*, 18 pp, (Pamphlet) The Hobart Manufacturing Co.
6863 on Reader Service Slip.

Simple operation with vacuum refrigeration*, 8 pp, (Cat) Croll-Reynolds Co.
6871 on Reader Service Slip.

Attachable condenser spray units for peak loads*, 6 pp, (Bul DCR-60) The Marley Company.
6866 on Reader Service Slip.

Sanitary screw pump has wide viscosity range*, 20 pp, (Bul 100) Moyno Pump Div., Robbins & Myers, Inc.
6890 on Reader Service Slip.

Stainless steel drums, food handling trucks, scoops, pails, etc.†, (Cat No. 60) Standard Casing Co., Inc.
6967 on Reader Service Slip.

Fully automatic, no-frost refrigeration rooms†, (Bul No. 105) Niagara Blower Co.
6968 on Reader Service Slip.

Continuous high capacity clarification with automatic sludge ejection†, (Cat) Centrico
6969 on Reader Service Slip.

"How Carbon Dioxide Serves You"†, 24 pp, Pure Carbonic Co.
6970 on Reader Service Slip.

Fluid and gas pressure tanks in stainless and carbon steel†, (Cat) Groban Supply Co.
6971 on Reader Service Slip.

Three-inch, fintube, double-pipe heat exchangers for low pressure applications, 8 pp, (Bul 110) Brown Fintube Co.
6972 on Reader Service Slip.

Continuously cooks, extrudes cereal grains†, (Specification Sheet 224) Sprout-Waldron
6973 on Reader Service Slip.

Highly intimate blends in 1 to 2 minutes†, (Bul No. 080B) Sturtevant Mill Co.
6974 on Reader Service Slip.

"Canned" pump delivers 115 gpm against 31 ft head, 4 pp, (Bul M-60) The Corley Company, Inc.
6975 on Reader Service Slip.

Bulk Handling, Accessories

"Primer" on selecting and using pneumatic conveyors*, 8 pp, (Fact File ER-G9) Fuller Co.
6909 on Reader Service Slip.

Line of bulk-handling equipment for the process industries, 1 p, Bucket Elevator Co.
6976 on Reader Service Slip.

Line of screw feed hoppers, screw feeders and specialty screw conveyors, 1 p, Bucket Elevator Co.
6977 on Reader Service Slip.

Conveyor accessories for bulk material handling, 2 pp, Bucket Elevator Co.
6978 on Reader Service Slip.

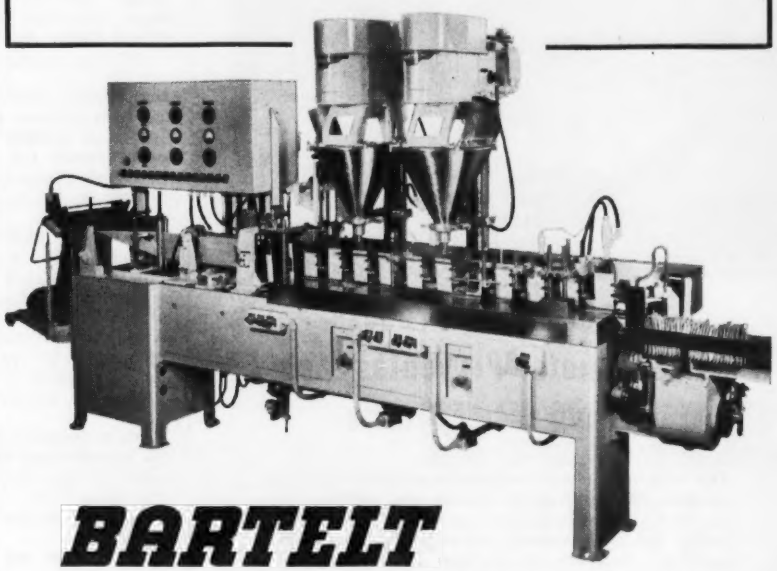
Screw conveyor and accessories — engineering and specification guide, 60 pp, (Cat Sec 200-C) Fort Worth Steel
6979 on Reader Service Slip.

Portable low-velocity, positive-pressure pneumatic/conveyor for free-flowing lightweight materials, 1 p, (Spec Sheet No. 221) Sprout, Waldron
6980 on Reader Service Slip.

Pneumatic flour handling systems at Italian specialties bakery, 4 pp, (Bul I-82) Sprout, Waldron
6981 on Reader Service Slip.

Photos and flow diagram of flour handling at National Biscuit's Houston bakery, 2 pp, (Bul 1287) Sprout, Waldron
6982 on Reader Service Slip.

ENGINEERED PACKAGING PROTECTION



BARTELT

Packaging Machinery Has Built-in Versatility to Meet Changing Market Requirements . . .

PROTECTION . . . for changing package sizes and products. The Bartelt Packager can be tooled to handle a variety of products and a wide range of package sizes.

PROTECTION . . . for your product. Pouches can be made from inexpensive webs or the finest barriers depending on product shelf-life requirements.

PROTECTION . . . against high labor costs. Completely automatic from roll stock to finished package.

PROTECTION . . . against maintenance problems and excessive down-time losses. Bartelt's straight-forward design and rugged construction assure efficient operation.

● **Write Today for Bartelt Brochures**

BARTELT ENGINEERING COMPANY
1900 Harrison Ave., Rockford, Ill. • New York Office: 370 Lexington Ave. N.Y.C.

6983 on Reader Service Slip.

AO's Goldberg Process Refractometer Prevents Waste ... Increases Profits

This in-stream Refractometer can be mounted in wall of process vessel, evaporator, vacuum pan, product pipe line or other location where continuous reading is desirable. Quickly determines total soluble solids in turbid and dark-colored concentrates such as jellies, jams, purees, juices and syrups.

1 **Prevents profit loss:** Determines exact endpoint of cooking batch by providing continuous, in-process readings of total solids. Prevents profit loss due to soluble solids "give away" by over concentration.

2 **Prevents product waste:** In-process readings on *hot* product eliminates old-fashioned external sampling with its consequent product waste and time loss. Savings in product alone, in most cases, will pay for the instrument in one season.

3 **Prevents errors:** Since product is always tested in-process, errors due to evaporation, temperature changes or opacity are eliminated. Readings are not affected by viscosity, foam, air bubbles or pulp and there's no need to correct for temperature differences between refractometer and process vessel. Accurate readings can be taken by anyone...no skilled technicians required.

4 **Three Brix ranges available:** 0-25%; 12-72%; 36-82% total soluble solids. Withstands pressure of 40 lbs. and temperatures ranging up to 250°F.

For further information write for Brochure SB10125

AO SPENCER

American Optical Company

INSTRUMENT DIVISION, BUFFALO 15, NEW YORK

6984 on Reader Service Slip.

new literature

Ingredients, Food Additives

All about citric acid*, 30 pp, (Citric Acid Brochure) Miles Chemical Company
6794 on Reader Service Slip.

Catalog of essential oils and certified food colors*, 36 pp, (April, 1960) Dodge & Olcott
6817 on Reader Service Slip.

Longer shelf-life for dry seasonings*, (fold-out Spisoseals brochure) Dodge & Olcott
6801 on Reader Service Slip.

Inactivating trace metals which have an adverse effect on color, clarity or stability in foods*, 20 pp, (Versene CA Bulletin) Dow Chemical Company
6797 on Reader Service Slip.

The use of algin for stabilizing frozen foods*, 6 pp, (Technical Bul F#54) Kelco Company
6800 on Reader Service Slip.

A review of research for the food industry*, 24 pp, ("Food Research") Merck & Co., Inc.
6816 on Reader Service Slip.

Reviews physical data and use of 94 organic and inorganic chemicals*, 16 pp, (Bul 100-D) Hooker Chemical Corp.
6815 on Reader Service Slip.

What sodium and calcium caseinates can do to improve product quality†, (Technical data and samples) Sheffield Chemical
6985 on Reader Service Slip.

Foam control for every job with silicone antifoamers or defoamers†, (manual) Dow Corning
6986 on Reader Service Slip.

How dairy whey can give appetite appeal to a variety of food products†, (Technical Bulletins) Western Condensing
6987 on Reader Service Slip.

Price list of flavorings and essential oils, 32 pp, (Cat) Florasynth Lab. Inc.
6988 on Reader Service Slip.

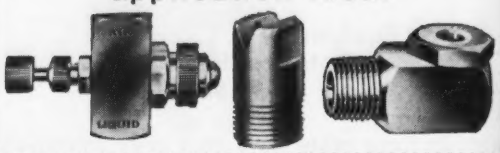
Packaging, Labeling, Cartoning

Explains new protective coating for food packages*, 12 pp, National Starch and Chemical
6958 on Reader Service Slip.

Cause and cure of adhesive sealing problems on the packaging line, 5 pp, Morningstar-Paisley
6989 on Reader Service Slip.

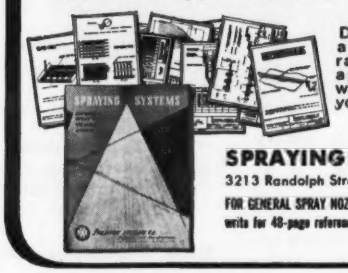
Instant-dry, waterproof aerosol stencil inks in choice of 9 colors, 2 pp, (Bul 601) Reynolds Ink
6990 on Reader Service Slip.

some
SPRAY NOZZLE
application ideas



for lower cost, better production

- use pneumatic atomizing nozzles on fruit and nut packaging lines for automatically opening bags and placing fumigant.
- you can add water to dry foods by spraying in precise form and quantity for exact control of moisture content.
- if you have a roof heat problem over ovens in summer, roof cooling spray nozzles will reduce temperatures as much as 18° F.
- clean transport truck tanks with spray nozzle heads ... eliminate costly hand cleaning.
- where water is used anyway and where products will float, a water trough conveyor is an idea, with spray nozzles used to keep products moving.



DATA SHEETS are available on a wide range of spray nozzle applications. Just write and describe your particular need.

SPRAYING SYSTEMS CO.
3213 Randolph Street • Bellwood, Illinois
FOR GENERAL SPRAY NOZZLE INFORMATION ... write for 48-page reference Catalog No. 24.

6991 on Reader Service Slip.

FORTIFY
YOUR PRODUCTS WITH

NATURAL
VITAMIN C

Increase your sales! Add healthful nutrition to your products. Use Hawaiian Acerola Cherry concentrate, the richest known source of natural vitamin C.

ACEROLA CONCENTRATE CAN BE USED IN THE FOLLOWING:

SOFT DRINKS	DRY CAKE MIXES	JELLIES
SYRUP	CANDIES	FRUIT JUICES
BABY FOODS	PUNCH	SHERBET

WRITE TODAY FOR COMPLETE INFORMATION

HAWAIIAN ACEROLA CO. LTD.
5600 Beach Blvd. • Buena Park, California

6992 on Reader Service Slip.

ONLY ERIEZ

has a *complete line* of Erium Powered

GRATE MAGNETS

designed specifically to

STOP TRAMP IRON and IRON FINES

Only Eriez Grate Magnets offer the widest range of models, sizes and construction, in the widest price range—all powered by ERIUM, an exclusive, high quality magnetic power source specifically designed and energized by Eriez.

Only Eriez has units designed for your exact needs—with the most effective, most powerful magnetic fields—protected by U.S. and foreign patents.

Only Eriez — world's leading producer of magnetic equipment—has the experience and know-how to provide the most effective Grate Magnets; you choose the one that does your job *best!*

All Eriez Grate Magnets are non-electric, self-contained • No wires or attachments • Low first cost; no operating or maintenance costs • Ruggedly built • Easily installed.

Available in these models: Wing type • Rotary type • Drawer type • Housed units • Multiple bank • Odd shapes • Housed vibratory units

Get all the facts
...write today

Eriez Mfg. Co., 75-LA Magnet Drive, Erie, Pa

ERIEZ

6993 on Reader Service Slip.

Conveyors, Racks, Accessories

Flat-top chain, specially designed to treat containers gently assures smooth pickup, smooth ride†, (Cat 1050) Link-Belt
6994 on Reader Service Slip.

Metal processing belts for continuous product flow meet demands of sanitation, heat, corrosion, drainage or direction of flow†, (Technical Literature) Ashworth Bros.
6995 on Reader Service Slip.

Case histories on how conveyor belts increase production†, (Booklet) American Steel & Wire
6996 on Reader Service Slip.

Metal-mesh belts mean longer life, fewer repairs, lower operating costs†, 130 pp, (Reference Manual) Cambridge Wire Cloth
6997 on Reader Service Slip.

Steel conveyor belts provide clean, efficient performance†, (Booklet E 738) Sandvik Steel
6998 on Reader Service Slip.

Fork Trucks, Accessories

Deciding between "Standard" and "special" lift trucks for unusual handling problems*, 8 pp, Automatic Transportation Co.
6930 on Reader Service Slip.

Kit for promoting safe inplant lift-truck operation*, Towmotor Corp.
6919 on Reader Service Slip.

Controls, Regulators, Indicators

Extensive listing of automatic controls for sugar processing*, 136 pp, (Manual M38-1) Minneapolis-Honeywell Regulator Company, Industrial Division
6880 on Reader Service Slip.

Wide range of uses for pneumatic indicating controller*, 6 pp, (Bul DM058) The Bristol Company
6886 on Reader Service Slip.

Portable pH meter is shock resistant*, 2 pp, (Data Sheet) Sel-Rex Instruments, Inc.
6887 on Reader Service Slip.

Precise volumetric control in finishing canned foods†, (Bul 566 LFP) Neptune Meter Co.
6999 on Reader Service Slip.

Simple, economic method for measuring pH†, (Data Sheet) Foxboro Co.
7000 on Reader Service Slip.

Complete line of counters†, (Cat 51-55) Durant Mfg. Co.
7001 on Reader Service Slip.

Electronic automation — the new way to break the cost barrier, 8 pp, (Bul 607-3) Strand Engineering Co.
7002 on Reader Service Slip.

Controls speed of motors by frequency variation, 8 pp, (Form F-1963) US Electric Motors Inc.
7003 on Reader Service Slip.

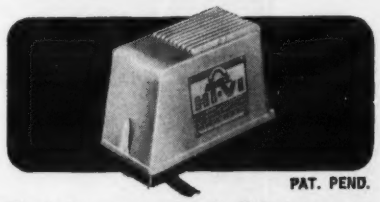
FOOD PROCESSING CARTOON *Hall of Fame*

"A tank gage, huh? That's a new one on me!"

UNSTICK stuck BINS

with new electro-permanent magnetic

ERIEZ HI-VI VIBRATORS



PAT. PEND.

Here's the newest and most efficient answer to those hard-to-move materials in sticky bins... designed to provide superior operating efficiency... exclusive pinpointed vibration gets right to the trouble spot – starts stubborn materials moving!

NO RECTIFIER NEEDED • COMPLETELY ENCLOSED HOUSING • GREATER VIBRATION IMPACT THAN COMPARABLE SIZE UNITS • RUGGED AND DURABLE • LOW FIRST COST • LOW OPERATING AND MAINTENANCE COST.

Special Mill Mutual ACCEPTED Units for HAZARDOUS DUSTY LOCATIONS
GET THE WHOLE STORY . . . WRITE TODAY
Eriez Mfg. Co., 75LB Magnet Dr., Erie, Pa.

ERIEZ

7004 on Reader Service Slip.

Ideal for Dairy and Food Industries

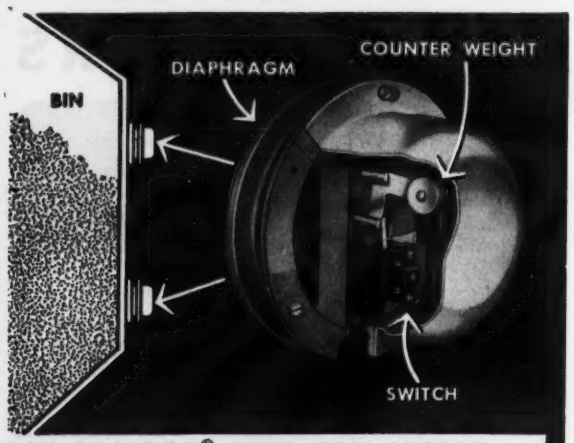
The Strahman Spray Nozzle does a better job with the least amount of water. This precision made nozzle enables the operator to get any type stream of water to do his job by simply pressing the lever. A soft spray is sent forth with slight pressure on the lever, and a strong straight stream may be had by pushing the lever all the way down. This convenient control of the wash water assures better cleaning with a lot less effort. The nozzle automatically shuts off the moment the lever is released, thereby eliminating all waste of water.

RENEWABLE RUBBER COVER. **The sturdy cover protects the nozzle and your equipment against knocks and dents. When the cover becomes worn, replace it with a new one.**

CONSULT YOUR DEALER

STRAHMAN VALVES, INC., NICOLET AVE., FLORHAM PARK, N. J.

7005 on Reader Service Slip.



BIN-DICATOR® PAYS FOR ITSELF FIRST TIME IT PREVENTS BIN OVERFLOW, CONVEYOR CLOG, ELEVATOR CHOKE-UP, MACHINERY DAMAGE, REPAIR SHUT-DOWN

If you handle bulk material you probably need Bin-Dicators. The nominal cost of this protection and automatic control makes it the lowest-cost modernization you can buy. Available with Explosion-Proof Switch.

THE BIN-DICATOR CO. *Write for free copy of catalog BD-15 or call*
13946-C Kercheval • Detroit 15, Mich. VAlley 2-6932

WE SELL DIRECT • PHONE ORDERS COLLECT

7006 on Reader Service Slip.

new literature

Laboratory Developments

Pocket refractometer made in four sizes*, 2 pp, (Bul) Epic, Inc.
6901 on Reader Service Slip.

Complete line of laboratory fume hoods*, 52 pp, (Cat FH-6) Metalab Equipment Co.
6900 on Reader Service Slip.

In-stream refractometer prevents waste, increases profits†, (Brochure SB10125) American Optical Co.
7007 on Reader Service Slip.

Miniature oil-less vacuum pumps and air compressors, 2 pp, (Bul BP-360-2M) Gast Manufacturing Co.
7008 on Reader Service Slip.

Sanitation

"Bakery Sanitation Manual"*, 34 pp, The Diversey Corporation
6835 on Reader Service Slip.

Disinfectant tablet is completely and instantly soluble*, 1 p, (Bul) First Spice Mixing Co., Inc.
6838 on Reader Service Slip.

Sanitation inspection checklist for edibles processors*, 2 pp, (Data Sheet SD 909-A) Puritan Chemical
6842 on Reader Service Slip.

Heavy-duty automatic tank cleaner, 4 pp, (Cat 444) Sellers Injector Corp.
7009 on Reader Service Slip.

Sanitation tools to improve sanitation level and lower costs, 4 pp, (1960 Brochure) The Huge Co.
7010 on Reader Service Slip.

Fly filling formula combats resistant or immune flies, 4 pp, The Huge Co.
7011 on Reader Service Slip.

Maintenance

Plastic fittings and fabrications for corrosive applications*, 4-page bulletin, Argo Plastic Products Co.
6825 on Reader Service Slip.

How to prepare concrete floors for protective coating*, 10 pp, (Bul 1019) Carboline Co.
6849 on Reader Service Slip.

Motor selection guide includes range of motors from 1/4 to 200 hp*, 56 pp, (Cat No. 200) Sterling Electric Motors
6850 on Reader Service Slip.

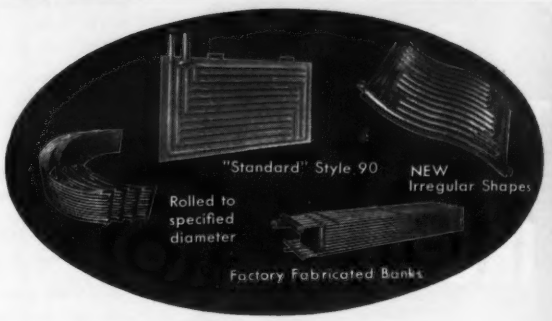
"Specialized Detergents Mechanically Applied Speed Brew House Cleaning"*, 3 pp, (Bul No. 79A) Oakite Products
6832 on Reader Service Slip.

Complete line of speed reducers†, 64 pp, (Torque-Arm Speed Reducer Bul) Dodge Manufacturing Co.
7012 on Reader Service Slip.

PLATECOIL®

FOR ALL KINDS OF TANK AND PROCESS HEATING AND COOLING

- Built to fit application requirements
- High heat transfer capacity
- Compact units save space
- Easy to install
- Easy to remove for cleaning
- Available in variety of weldable metals
- Operating Pressures up to 250 psig.

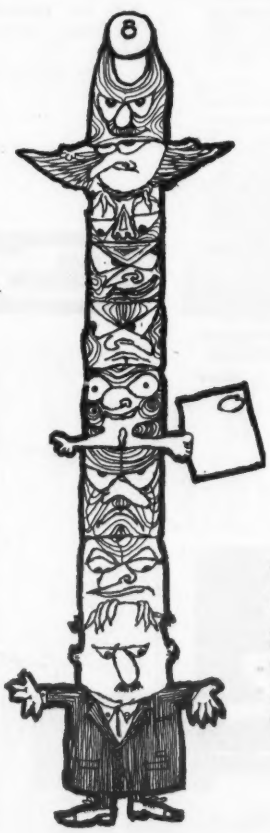


Send for Bulletin P53

PLATECOIL® DIVISION

TRANTER MANUFACTURING, Inc., LANSING 9, MICHIGAN

7013 on Reader Service Slip.



are you the low man on the totem-pole?

. . . always last to receive FOOD PROCESSING?

You needn't be. To get your *own* copy, addressed to you personally, fill out the subscription request form opposite this page. No charge, of course, if you qualify.

SPACE AGE FLAVORS...

...with that Country Kitchen Taste!

This is the day of jet-flight and dehydrated potatoes; atomic energy and frozen bread; super-sonic speed and "quicker-than-instant" mixes for everything from soups to desserts. This is the threshold of the space age and the era of convenience foods. Flavors for these modern foods must be as dynamic as the technology of their formulation . . . as carefully designed as the science that developed them. Yet, these space-age foods must still retain that home cooked taste. Only a company that keeps thoroughly abreast of the newest developments in food can give you this kind of "built for the product" flavor. Fries & Fries provides you with space-age flavors with that country kitchen taste! Let our laboratories show you what dynamic flavor research means.

MANUFACTURING CHEMISTS
FRIES & FRIES
INC.
CINCINNATI
U.S.A.

Cincinnati 110 E. 70th St. New York 418 E. 91st St.

7014 on Reader Service Slip.

new literature

General cleaner easily removes the most difficult food soils†, (Bul B-8165) Oakite Products, Inc.
7015 on Reader Service Slip.

Corrosion-resistant mortar for floors, sewers, processing vessels, chimneys and other masonry installations†, (Data sheets) Sauereisen Cements Co.
7016 on Reader Service Slip.

Filter for liquids with a low percentage of compressible solids†, (Bul 146) T. Shriver & Co., Inc.
7017 on Reader Service Slip.

Describes properties of foam-in-place polyurethane insulation, 4 pp, (Bul J-650) Baldwin-Ehret-Hill, Inc.
7018 on Reader Service Slip.

Fiber glass reinforced epoxy fittings offer resistance to wide range of corrosively active liquids, 2 pp, (Cat sheet) Ed Conley Plastic Corp.
7019 on Reader Service Slip.

Complete line of centralized systems of lubrication, 24 pp, (Bul No. 26-T) Farval Div., Eaton Mfg. Co.
7020 on Reader Service Slip.

Positive leak protection for all types pipe connections, 2 pp, (Brochure and Free Sample) Friesland Plastics Co.
7021 on Reader Service Slip.

Special customer services for electrical motors, 4 pp, (Bul No. F-1974) US Electrical Motors.
7022 on Reader Service Slip.

Epoxy adhesive applications and physical properties, (fold-out sheet) Furane Plastics, Inc.
7023 on Reader Service Slip.

Sight glasses for ovens, absorption columns, reaction kettles, furnaces, stills and processing tanks, 4 pp, (Bul EB-20) Corning Glass Works
7024 on Reader Service Slip.

Application data for plug-in bus ducts, 28 pp, (Application Data 30-661) Westinghouse Electric Corp.
7025 on Reader Service Slip.

Piping, Pumps, Valves, Accessories

Spray nozzle design reduces clogging and guarantees dependable food processing applications to wax fruits, rinse vegetables, powder milk, dry eggs, wash filter cake, humidify banana rooms†, (Cat 1) Monarch Mfg.
7026 on Reader Service Slip.

Spray nozzle application ideas for lower cost, better production†, (Data sheets) Spraying Systems Co.
7027 on Reader Service Slip.

FLAVOREX
Jamaica Style

RUM FLAVOR

...puts the "YUM" in your product!

• Delight the palates of young pirates and their parents by adding Flavorex Rum Flavor to your product. Great for a *hearty accent!* Exquisitely exotic as an *extra touch of flavor!*

• Use Flavorex Rum Flavor in *baked goods, confections, puddings, eggnog mixes, ice cream,* and other foods. You'll be doubly rewarded these ways . . . perfect for your present formulas . . . helps earn consumers' preference for your product.

• Flavorex Jamaica Style Rum is a flavor concentrate of natural and synthetic esters produced in our own plant and blended by our masters of the art. Run a batch test. You'll discover that every fragrant drop adds mellow tropical sunshine to your product. Write for free sample, or place a trial order today.

Rum Flavor No. B224...$12 per gallon

Better Flavors for Better Products
FLAVOREX CO., INC.
302 S. CENTRAL AVE., BALTIMORE 2, MD.

7028 on Reader Service Slip.

CLASSIFIED SECTION

FOOD PROCESSING

PROFESSIONAL & TECHNICAL SERVICES

FOSTER D. SNELL INC
RESEARCH AND DEVELOPMENT CONSULTANTS

WISCONSIN ALUMNI RESEARCH FOUNDATION
LABORATORY SERVICES
for the FOOD, FEED, DRUG and CHEMICAL INDUSTRIES
Analyses, Biological Evaluation, Toxicity Studies, Insecticide Testing and Screening, Flavor Evaluation.
Project Research and Consultation
Write for Price Schedule
P. O. Box 2217 • Madison 1, Wis.

ENGINEERING REPORTS
DESIGN
CONSTRUCTION MANAGEMENT

CHAS. T. MAIN, INC.
Consulting Engineers

BOSTON, MASSACHUSETTS • CHARLOTTE, N. CAROLINA

EQUIPMENT & MATERIALS

FOR SALE

2 Pneumatic Scale Co. Automatic Packaging Lines Each Including:

Double Package Maker, Filler, Weigher, and Tin-Tie Style Closer, for Coffee or Other Dry Material.

Excellent Condition .... $17,500 Each

REPLY TO: MR. E. S. ROSE
AMERICAN STORES COMPANY
124 NORTH 15TH STREET
PHILADELPHIA 2, PENNSYLVANIA

WATER FILTRATION SYSTEM
in first class condition for sale. 1800 gpm diatomaceous earth water filter and carbon purifier system including all auxiliary appurtenances. Units available for immediate shipment. Purchased new in 1958 — used one year. Original cost $66,500.00. Bids solicited.

Reply to: CL 1121 Food Processing
111 E. Delaware Pl., Chicago 11, Ill.

FIRST CLASS EQUIPMENT FROM YOUR FIRST SOURCE

2 S/S Flowmaster Kombinators Model No. 200 200 G.P.H. with 7½ HP
Tri-Homo Disperser Type 316 S/S with 10 HP motor
3 Pneumatic Scale Aut. Lines incl. 16 Sp. S.S. Rotary Filler, Duplex Labeler, Bottle Cleaner, Capper.
FMC Automatic No. 10 Can Filler Model No. 60; 6 Stainless Spouts.
Hope Stainless 4 Piston Filler.
FMC Hand-Pack Filler; 30 Ports.
Horix Gravity-Vac. 14 Spout Filler
Stokes & Smith Powder Fillers.
Triangle Elec-tri-Pak 4 Station Conveyor Type Model SO Packager.
N.J. Poney Labelrite Labelers.
Can Labelers by Standard-Knapp, FMC., Kyler, Burt and others.
Stainless Steel Kettles-Tanks.
Stainless Steel Vacuum Pans.
Continental Panama Can Closer
Standard Knapp Case Sealer No. 429
Urschel, Anderson & Sterling Dicers

Send for Complete Lists

FIRST MACHINERY CORP.
209-289 TENTH ST.
BROOKLYN 15, N. Y.
STerling 8-4672

FOR SALE

New Jersey labeler model M (Pony Labelrite); completely reconditioned — $900. (Originally $2300.)

Hope single piston filler, practically new . . . $650. (Originally $1100.)

E. Gustafson
1000 Crosby St., Chicago 10, Ill.
Phone: MOhawk 4-1800

EMPLOYMENT & OPPORTUNITIES

Design Engineers

Expanding operations by a leading manufacturer of quality dairy, food and beverage machinery has created several attractive design assignments. Requisites: M.E. or E.E. degree, and experience in one of the following areas—Machine Design, Materials Handling Machinery, Liquid Package Fillers, Heat Exchanger Design and Electro-Mechanical Design. Submit resume to Industrial Relations Manager.

Cherry-Burrell Corp.
2400 6th St. S. W.
Cedar Rapids, Iowa

CHEMIST - FOOD

Laboratory Control Testing Of Raw Materials And Food Specialties Leading To Research and New Products Development. Pa., N.Y. Area. Present Employees Informed. Submit Resume Of Experience, Qualifications, References, Age, Etc.

Reply to CL 1122 FOOD PROCESSING
111 E. Delaware Pl., Chicago 11, Ill.

a new service of
FOOD PROCESSING
magazine

new literature

Design of impervious graphite diaphragm valves are such that they have high discharge due to a high coefficient of velocity, 5 pp, (Bul 1610) Falls Industries, Inc.
7029 on Reader Service Slip.

Technical details, dimensions and capacity data on steam traps, temperature regulators and heating devices, 12 pp, (1960 Condensed Cat) Sarco Co., Inc.
7030 on Reader Service Slip.

Catalog of tube fittings sizes and dimensions, 118 pp, Lenz Company
7031 on Reader Service Slip.

Two size pumps for handling inflammable liquids in hazardous locations, 4 pp, (Bul No. 728.1) Goulds Pumps, Inc.
7032 on Reader Service Slip.

Gasketing and gaskets for flanges, joints, boiler manholes, furnace doors and similar applications, 12 pp, (Cat GG-1259) Greene, Tweed & Co.
7033 on Reader Service Slip.

Plastic tubing, rolls, panels, sheets, 68 pp, Kaufman Glass Co.
7034 on Reader Service Slip.

Describes features of union bonnet gate valve, 4 pp, (Circular on Fig. 3125 Gate Valve) Lunkenheimer Co.
7035 on Reader Service Slip.

Four basic types of pipeline strainers for condensate, steam, water, oil, air, gas and other pipe fluids, 4 pp, (Bul 1210) Sarco Company, Inc.
7036 on Reader Service Slip.

Teflon lined flexible hose specially designed for steam transmission, 4 pp, Titeflex, Inc.
7037 on Reader Service Slip.

Miscellaneous

Corn In Industry*, 64 pp, Corn Industries Research Foundation
6785 on Reader Service Slip.

Advantages and details of renting material handling equipment, 16 pp, Clark Rental Corp.
7038 on Reader Service Slip.

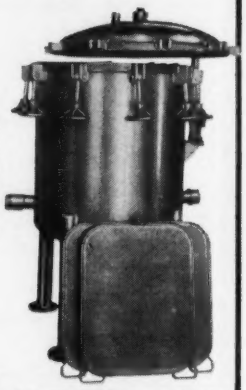
Description of plant layout, construction planning and building with models, 8 pp, Knight Models, Inc.
7039 on Reader Service Slip.

Ice and snow removal, 1 p (leaflet) Formula 33 Corp.
7040 on Reader Service Slip.

Plastic stock shapes, molded and fabricated parts, 16 pp, (Bul AD-177) Garlock Inc.
7041 on Reader Service Slip.

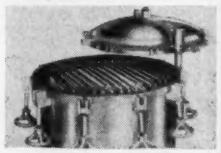
FOR LIQUIDS WITH A LOW PERCENTAGE OF COMPRESSIBLE SOLIDS.....

SHRIVER'S TYPE "VTVL" is the FILTER to install



Vertical tank, vertical leaf pressure filter; filter areas from 20 to 510 sq. ft.; tank diameter from 18" to 48".

Sluicing header in cover (optional) directs spray on surface of leaves to slurry cake down for removal from tank.



Showing filter leaves nested in tank.

For clarification or polishing of liquids containing a low percentage of solids, particularly if those solids may be discharged as waste, we recommend the Shriver "VTVL" Filter. It provides convenient, efficient, leakproof filtration at high, uniform rates. There is a size to meet your needs.

For dry cake discharge and for processing more concentrated slurries we recommend the "HTVL" — horizontal tank vertical leaf filter.

Write for Bulletin 146.

T. SHRIVER & CO., Inc.

892 HAMILTON ST., HARRISON, N.J.

7042 on Reader Service Slip.

ADVERTISERS in this issue

A

Air Reduction Company, Inc., Customer Service Packaging Laboratory 89
Airslide and Dry-Flo Car Division, General American Transportation Corporation 110
Aluminum Company of America 121
American Optical Company, Instrument Division 126
American Steel & Wire Division, Cyclone Fence Dept., United States Steel 109
Angelus Sanitary Can Machine Company 9
Ashworth Bros., Inc. 100
Atlas-Pacific Engineering Company, Inc. 81

B

Bahnson Company, The 101
Bartelt Engineering Company, Inc. 125
Bin-Dicator Co., The 128
Blaw-Knox, Buflovak Equipment Division 76-77
Bliss Company, E. W. 24
Butler Manufacturing Company 70

C

Cambridge Wire Cloth Co., The 96
Centrico Incorporated 87
Cherry-Burrell Corporation 84-85
Clinton Corn Processing Company 38
Clipper Belt Lacer Company 104
Clupak, Inc. 118
Colton Company, Arthur 88, 124
Consolidated Packaging Machinery Corp., a Subsidiary of International Paper Company 122
Container Corporation of America 14
Corn Products Company, Industrial Division 55
Crown Zellerbach Corporation, Gaylord Container Division 36
Cyclone Fence Dept., Amer. Steel & Wire Div. United States Steel 109

D

Darnell Corporation, Ltd. 100
Detecto Scales, Inc. 120
Diamond Crystal Salt Co. 58
Distillation Products Industries, a division of Eastman Kodak Company 56, 59
Dodge Manufacturing Corporation 98-99
Dodge & Olcott, Inc. 132
Dorr-Oliver Incorporated 23
Dow Chemical Company, The 31, 67
Dow Corning Corporation 64, 66
Durant Manufacturing Co. 124
Durkee Technical Service 52

E

Edlund 4
Edmont Inc. 68
Eriez Mfg. Co. 127
Exact Weight Scale Co., The 108

F

Fairbanks, Morse & Co., Scale Division 123
Fenco, Inc. 112
Firmenich, Inc. ..... 3rd Cover
Fischbein Co., Dave 112
Flavorex Co., Inc. 129
Florasynth Laboratories, Inc. 48
Food Machinery and Chemical Corporation, Canning Machinery Division 18
Foxboro Company, The 10
Frick Company 21
Fries & Fries, Inc. 129

G

Gardner-Denver Company 82, 83
Gas Atmospheres, Inc. 92
Gates Rubber Company, The 61
Gaylord Container Division, Crown Zellerbach Corporation 36
General American Transportation Corporation, Airslide and Dry-Flo Car Division 110
Girdler Process Equipment Division, Chemetron Corporation 116-117
Givaudan Flavors Inc. 12
Groban Supply Company 112

H

Hawaiian Acerola Co. Ltd. 126
Hansen's Laboratory, Chr. 50
Hayssen Manufacturing Company 115
Henszey Company Incorporated 113
Hercules Powder Company, Huron Milling Division, Virginia Cellulose Department 54
Hercules Powder Company, Virginia Cellulose Department 49
Hoerner Boxes, Inc. 22
Hubinger Company, The 42
Hyster Company, Hyster Leasing Division 103

I

Inland Steel Container Company, Division of Inland Steel Company 124
International Flavors & Fragrances Inc., Flavor Division ..... 4th Cover
International Salt Company 13

J

Jenkins Bros. 86
Johns-Manville, Celite Division 75

K

Kelco Company 46
Kraft Foods, Industrial Products Division 57
Krenz Incorporated, Oscar 88

L

Ladish Co., Tri-Clover Division 7
Langsenkamp Co., F. H. 120
LaPorte Mat & Mfg. Co. 114
Lift Trucks, Inc. 114
Link-Belt Company 119

ADVERTISING REPRESENTATION

CHARLES H. OESTMANN — *Vice President-Sales*

Chicago 11, 111 East Delaware Place, WHitehall 4-6141, Leo L. Smith, Western Advertising Director; William B. Bowen, District Manager; Frank D. Linthicum, District Manager; R. Dewey Humason, District Manager

Los Angeles 57, Granada Building, 672 So. La Fayette Park Place, DUnkirk 8-2286, Wettstein, Nowell & Johnson, Inc., Bob Wettstein, Jerry Holtz

New York 17, 369 Lexington Avenue, MUrray Hill 6-7738, John A. Mulheren, Eastern Advertising Director; Herman Faiola, District Manager; Raymond V. Morrow, District Manager, Quentin Orza

Portland 5, 337 Pittock Block, 921 S.W. Washington Street, CApital 8-4107, Wettstein, Nowell & Johnson, Inc.

San Francisco 5, 417 Market St., YUkon 2-9537, Wettstein, Nowell & Johnson, Inc., Jerry Nowell, Gene R. Watts

Southeastern States, 40 Peachtree Place, N.W., Atlanta 9, Ga., TRinity 2-2235, Joe Howell

Get a FREE test length of Cyclon NT 470 flexible, plastic, FOOD TUBING!

THERE'S NOTHING ELSE LIKE IT!

Developed especially for food and beverage processing . . .Formulation NT 470-B approved by U. S. Dept. of Agriculture for use with beverages, milk, and fatty acids . . . Specify NT 470-F for other food processing applications.

Of course CYCLON 470 is nontoxic! . . . can be sterilized with normal bactericides! . . . can be autoclaved repeatedly at 220°F. for 30 minute periods! . . . will not craze, crack or deteriorate in recommended applications! . . . noncontaminating! . . . very smooth interior aids flow characteristics! . . . extensive range of sizes and wall thickness for use at temperatures to 175°F!

TO GET YOUR TEST LENGTH: Merely state your required service. You will receive our recommendations together with your sample length taken from regular inventory stock. Write direct to:

MUNRAY
PRODUCTS, DIVISION TEXTRON INC.

SPECIALISTS IN ENGINEERED PLASTICS
12410 Crossburn Avenue Cleveland 35, Ohio
Distributors in All Major Cities

7043 on Reader Service Slip.

D&O proudly presents THE PERFECT SEASONING . . . the most scientific approach to seasonings, developed at the D&O Dry Materials Division.

PREMIUM QUALITY:

SPISOSEALS

SPISOSEALS are a line of powdered spice flavors based on spray dried oils and oleoresins, precisely formulated for use as alternates for crude spices, essential oils and oleoresins, solubilized oils, and dry solubles. There is no form of seasoning with finer, more well rounded flavor, nor any with such ease of handling.

SPISOSEALS: guaranteed flavor control and instant flavor release. Unsurpassable shelf life: these "locked-in" seasonings by virtue of the impermeability of their structure (tiny globules of oil secured each in its own individual casing) are protected against ravages of time, spoilage, volatilization.

SPISOSEALS: water soluble; completely and uniformly dispersible, both in dry products and in aqueous liquids where emulsion qualities set up a colloidal suspension system assuring permanent dispersion.

SPISOSEALS: stable, will not dry off — proved by analysis. Free from contamination, will never speck or discolor product.

SPISOSEALS may be custom formulated to replace any blend of spice flavors you are now using . . . We invite processors of quality food products to sample this new line of premium quality seasonings. Send your request to D&O Dry Materials Division, 249 Goffle Road, Hawthorne, N. J.

Write for copy of SPISOSEALS brochure

D&O

FLAVOR BASES • ESSENTIAL OILS
AROMATIC CHEMICALS
DRY FLAVORING MATERIALS

Dodge & Olcott Inc.

180 Varick Street, New York 14, N. Y.

Sales Offices in Principal Cities OUR 162nd YEAR OF SERVICE

7044 on Reader Service Slip.

(Continued from preceding page)

Liquidometer Corp., The 8

M

M-H Standard Corporation 68
Mack Trucks, Inc. 111
Mayon Plastics 64
Meer Corporation 88
Meyer Machine Company 114
Monarch Mfg. Works, Inc. 43
Morehouse-Cowles, Inc. 50
Munray Products, Division Textron Inc. 131

N

National Starch and Chemical Corporation 20
Neptune Meter Company, Liquid Meter Division 74
Niagara Blower Company 101
Nukem Products Corp. A Subsidiary of Amercoat Corp. 71

O

Oakite Products, Inc. 60
Ogden Filter Co., Inc. 120
Olin Mathieson, Packaging Division 41
Orr & Sembower, Inc. 91

P

Pacific Vegetable Oil Corp. 53
Pfaudler Permutit Inc., Pfaudler Division 66
Pfizer & Co., Inc., Chas., Chemical Sales Division 17, 44
Pittsburgh Corning Corp. 69
Powell Company, The Wm. 80
Pulverizing Machinery Company, A Division of American-Marietta Company 6
Pure Carbonic Company, A Division of Air Reduction Company, Incorporated 19
Putman Publishing Company 120, 122, 129

R

Red Star Yeast & Products Co. 47
Refined Syrups & Sugars, Inc. 15
Rietz Manufacturing Co. 79
Ritter & Co., F. 3
Rohm & Haas Company 65

S

Sandvik Steel, Inc., Steel Belt Conveyor Dept. 104
Sarco Company, Inc. 62-63
Sauereisen Cements Co. 68
Sellers Injector Corporation 68
Sheffield Chemical, A Division of National Dairy Products Corporation 51
Shriver & Co., Inc., T. 131
Simplicity Engineering Company 90
Southwestern Engineering Company 11
Spraying Systems Co. 126
Sprout-Waldron 79
Staley Mfg. Co., A. E. 40
Standard Casing Company, Inc., The 64
Standard Conveyor Company 105
Sterling, Fleischman Company 112
Strahman Valves, Inc. 128
Sturtevant Mill Co. 43
Sunkist Growers, Products Sales Dept. 35

T

Takamine, Miles Chemical Company Division of Miles Laboratories, Inc. 39
Taylor Instrument Companies 88
Torit Manufacturing Company 63
Towmotor Corporation 97
Tranter Manufacturing Inc., Platecoil Division 128

U

United States Steel, Amer. Steel & Wire Div. Cyclone Fence Dept. 109
Urschel Laboratories, Inc. 78

V

Viber Company 113
Vibra-Screw Feeders, Inc. 102
Victor Balata & Textile Belting Co. 103

W

Waukesha Foundry Co., Pump Division 93
Wenger Mixer Manufacturing 92
Western Condensing Company ..... 2nd Cover

Y

Yale & Towne Manufacturing Company, The, Materials Handling Division 106-107

Be Sure To Give Your Address

NO ENVELOPE NECESSARY — FOLD, SEAL, MAIL — POSTAGE PAID

If you want more information on ingredients, processes, controls or developments discussed herein, as you read this issue, ask our READER SERVICE DEPT. . . . use this sheet

NOVEMBER 1960

READER SERVICE SLIP

As you read editorial articles and advertisements which interest you, on which you'd like more information . . . note key number under each and circle this number below. Then fill in your name, title, company, main product and address at the bottom of this sheet and mail . . . no postage, no envelope necessary. Information will come to you direct, without obligation.

Expiration date for these numbers is February 10, 1961.

6751	6801	6851	6901	6951	7001
6752*	6802	6852	6902	6952	7002
6753	6803	6853	6903	6953	7003
6754	6804	6854	6904	6954	7004
6755	6805	6855	6905	6955	7005
6756	6806	6856	6906	6956	7006
6757	6807	6857	6907	6957	7007
6758	6808	6858	6908	6958	7008
6759	6809	6859	6909	6959	7009
6760	6810*	6860	6910	6960	7010
6761	6811	6861	6911	6961	7011
6762	6812	6862	6912	6962	7012
6763	6813	6863	6913	6963	7013
6764	6814	6864	6914	6964	7014
6765	6815	6865	6915	6965	7015
6766	6816	6866	6916	6966	7016
6767	6817	6867	6917	6967	7017
6768	6818	6868	6918	6968	7018
6769	6819	6869	6919	6969	7019
6770	6820	6870	6920	6970	7020
6771	6821	6871	6921	6971	7021
6772	6822	6872	6922	6972	7022
6773	6823	6873	6923	6973	7023
6774	6824	6874	6924*	6974	7024
6775	6825	6875	6925	6975	7025
6776	6826	6876	6926	6976	7026
6777	6827	6877	6927	6977	7027
6778	6828	6878	6928	6978	7028
6779	6829	6879	6929	6979	7029
6780	6830	6880	6930	6980	7030
6781	6831	6881	6931	6981	7031
6782	6832	6882	6932	6982	7032
6783	6833	6883	6933	6983	7033
6784	6834	6884	6934	6984	7034
6785	6835	6885	6935	6985	7035
6786	6836	6886	6936	6986	7036
6787	6837	6887	6937	6987	7037
6788	6838	6888	6938	6988	7038
6789	6839	6889	6939	6989	7039
6790	6840	6890	6940	6990	7040
6791	6841	6891	6941	6991	7041
6792	6842	6892	6942	6992	7042
6793	6843	6893	6943	6993	7043
6794	6844	6894	6944	6994	7044
6795	6845	6895	6945*	6995	7045
6796	6846	6896	6946	6996	7046
6797	6847	6897	6947	6997	
6798	6848	6898	6948	6998	
6799	6849	6899	6949	6999	
6800	6850	6900	6950	7000	

*Since there are several items covered by this number, please list this number with the specific item on which you want additional information in the "Multiple Listings" column at right

FOOD PROCESSING Handbook Suggestion: .....

.....

Multiple Listings

for items with*

Key No.	Description

☐ My favorite FOOD PROCESSING cartoon, nominated for "FP Cartoon Hall of Fame", is:

_____

_____

Please type or print and be sure to give your title and main product of Company

Name ..... Title .....

Company ..... Main Product .....

Street Address of Company .....

City ..... Zone No. ..... State .....

Be Sure To Give Your Address

NO STAMP – NO ENVELOPE NECESSARY

Just FOLD, SEAL and MAIL

Be Sure to Sign Your Name . . . See Other Side

No Postage Stamp Necessary If Mailed in the United States

BUSINESS REPLY MAIL
First Class Permit No. 30692 Chicago, Ill.

Postage Will be Paid by Addressee

FOOD PROCESSING

PUTMAN PUBLISHING COMPANY

111 EAST DELAWARE PLACE

CHICAGO 11, ILLINOIS

This is a Service for Readers
– No Obligation

Change of Address • Subscription Request Form

(PLEASE TURN PAGE)

Postage Will be Paid by Addressee

No Postage Stamp Necessary If Mailed in the United States

BUSINESS REPLY MAIL
First Class Permit No. 30692 Chicago, Ill.

FOOD PROCESSING

PUTMAN PUBLISHING COMPANY

111 EAST DELAWARE PLACE

CHICAGO 11, ILLINOIS

Seal Here

NO STAMP – NO ENVELOPE NECESSARY

Just FOLD, STAPLE and MAIL

Be Sure to Sign Your Name . . . See Other Side

This is a Service for Readers
– No Obligation

FOLD THIS SIDE *IN* FIRST

NO ENVELOPE NECESSARY — FOLD, STAPLE, MAIL — Postage Paid

Special subscription request-qualification form for use by

Management and technical men who wish to receive FOOD PROCESSING without charge . . . fill in form below

If you are responsible for processing operations, in a management or technical capacity, as corporate officer, manager, plant superintendent, food technologist, chemical engineer, chemist, engineer, or equivalent responsibility . . . in a plant of substantial operations* where food processing is an important factor . . . FOOD PROCESSING will be sent to you without charge or obligation . . . if you request it. Use form below.

NEW READER . . . If you qualify as outlined above, FOOD PROCESSING will be sent to you without cost or obligation. In requesting, be sure to answer all questions. If your firm is not rated or listed in standard references, indicate size of the company by capital rating or number of employees. Unless all information is given, magazine will not be sent.

Please print or type.

Name _____ Title _____

Company _____

Main Product _____

No. of Employees or Capital Rating _____

Street Address of Company _____

City _____ Zone No. _____ State _____

CHANGE OF ADDRESS . . . Use this form to notify us of a change in address. Please answer all questions in regard to your new affiliation, and in addition give us your former address including company, city and state.

Please print or type.

Former Company Affiliation _____ Former Address _____

Your Name _____ Present Title _____

Present Company _____ Main Product _____

No. of Employees or Capital Rating _____

Street Address of Company _____

City _____ Zone No. _____ State _____

* "substantial operations" does not necessarily mean an extremely large plant. But requests for the magazine exceed supply so we must set standards to insure publication being sent where it can be used to best advantage.

NEW
RANGE JUICE
FLAVOR

after 13 years of basic re- and application studies, nich brings you Imitation e Juice Flavor with the taste idely known and preferred lts and children alike.
re's none of the bitterness of el, none of the fattiness of ee-ripened fruit, none of tificiality associated with l juices and sophisticated of geographically scattered varieties.
t important, Firmenich on Orange Juice Flavor is isely the same strength and ter time after time, ton after here are no variations in due to crops, seasons, and as with the natural juice. irmenich quantities are un- d.
'll find this new orange lavor—already widely used es, cookies, candies, soft , and such pharmaceuticals amin and mineral supple- , chewable tablets, and chil- aspirin—offers new possi- s for:

and Jellies
ries
s, Toppings, Fillings
Salads
rs and Syrups
als and Liqueurs
and Candy
ered Drinks
l Plating
ream, Ripples, Sherbets
ored Sugars
ed and Frozen Fruit
maceutical Flavorings
Drinks
les, Pancakes
tin Desserts

les in liquid or powder form our commercial needs.

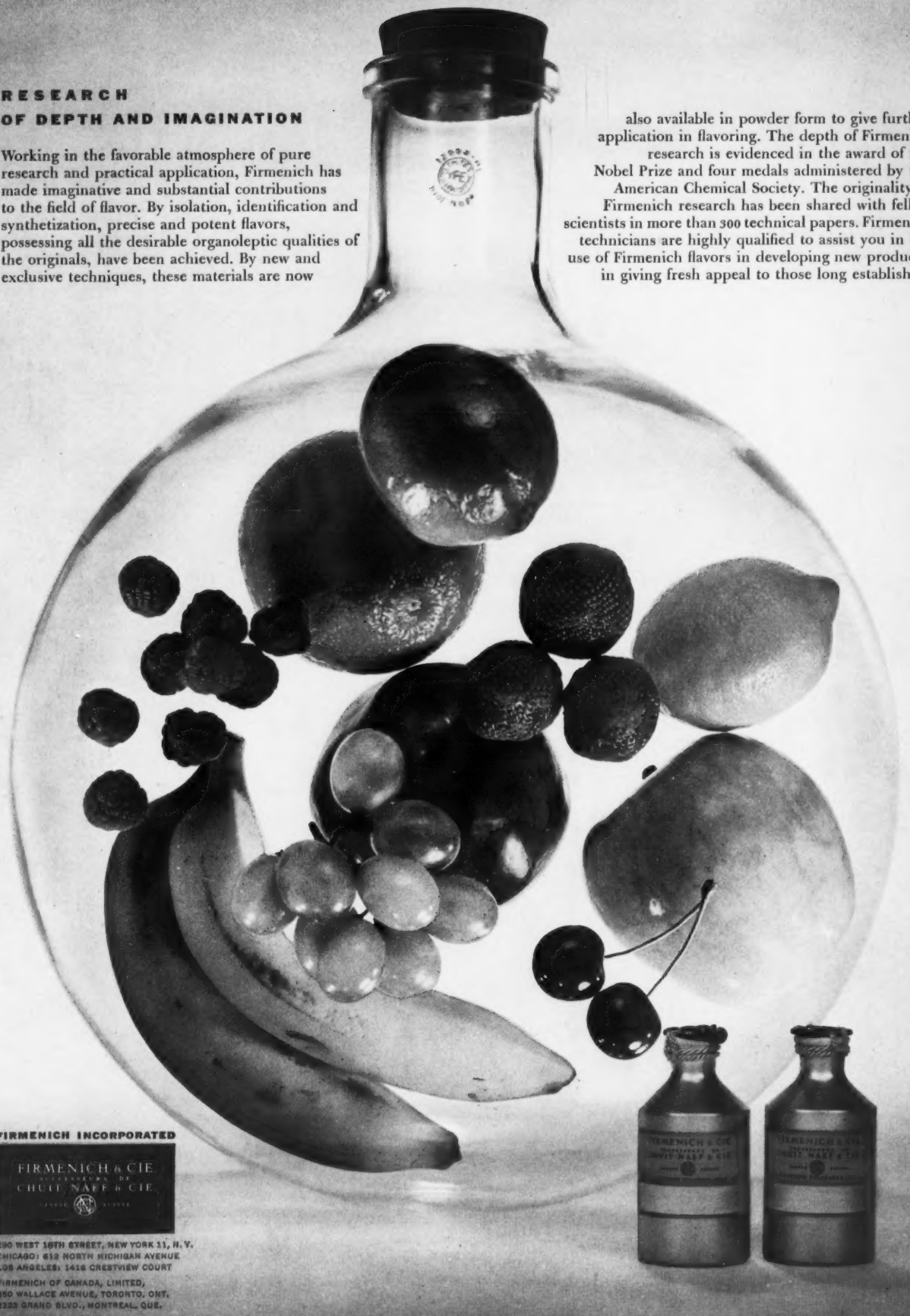
MENICH INCORPORATED

FIRMENICH & CIE
SUCCESSEURS DE
CHUIT NAEF & CIE

5 on Reader Slip.

RESEARCH
OF DEPTH AND IMAGINATION

Working in the favorable atmosphere of pure research and practical application, Firmenich has made imaginative and substantial contributions to the field of flavor. By isolation, identification and synthetization, precise and potent flavors, possessing all the desirable organoleptic qualities of the originals, have been achieved. By new and exclusive techniques, these materials are now also available in powder form to give further application in flavoring. The depth of Firmenich research is evidenced in the award of the Nobel Prize and four medals administered by the American Chemical Society. The originality of Firmenich research has been shared with fellow scientists in more than 300 technical papers. Firmenich technicians are highly qualified to assist you in the use of Firmenich flavors in developing new products, in giving fresh appeal to those long established.



FIRMENICH INCORPORATED

FIRMENICH & CIE
SUCCESSEURS DE
CHUIT NAEF & CIE

290 WEST 10TH STREET, NEW YORK 11, N. Y.
CHICAGO: 612 NORTH MICHIGAN AVENUE
LOS ANGELES: 1416 CRESTVIEW COURT

FIRMENICH OF CANADA, LIMITED,
350 WALLACE AVENUE, TORONTO, ONT.
2323 GRAND BLVD., MONTREAL, QUE.

GENEVA • PARIS • LONDON

WHICH FLAVORS WILL OUTSELL?

Identical flavors to the eye, yes . . . to the taste, no. The basic difference in each case is the unique flavor of one—perfected to outsell—developed by IFF.

Creating outstanding flavors for individual products is an experienced specialty of IFF. The result is a product which establishes brand demand, repeat sales, in a highly competitive market.

And if you are in the international market, IFF can minimize problems of supply. Uniform manufacturing and quality control in all of its plants throughout the world assure customers that IFF flavors, wherever ordered, remain the same from batch to batch.

For the flavors that outsell, contact IFF.

iff

FLAVOR DIVISION

INTERNATIONAL FLAVORS & FRAGRANCES INC.

417 Rosehill Place, Elizabeth 2, N. J.

Leading Creators and Manufacturers in the World of Flavor

ARGENTINA AUSTRIA BELGIUM BRAZIL CANADA ENGLAND FRANCE GERMANY HOLLAND INDONESIA ITALY NORWAY SOUTH AFRICA SWEDEN SWITZERLAND U.S.A.

7046 on Reader Service Slip.

FOOD PROCESS

. . . published by . . .
Putman Publishing C
CREATORS OF
READER ACT
MAGAZINES
. . . featuring all th
essential elements:
- TERSE VITAL EDITOR
- HAND-PICKED CIRCULATION
- "EXECUTIVE" FORMA
- HIGH VISIBILITY
- QUALITY READERSH
- MORE READER ACT